

# Video Camera Recorder

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## Operating Instructions

Before operating the unit, please read this manual thoroughly, and retain it for future reference.

## Owner's record

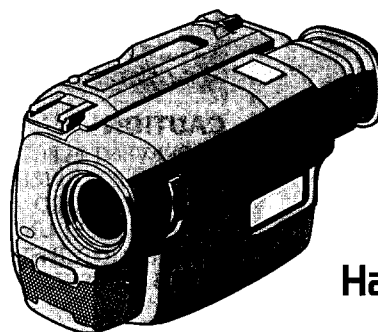
The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. **CCD-**

Model No. **AC-**

Serial No. \_\_\_\_\_

Serial No. \_\_\_\_\_



**Handycam**

**video Hi8**

**CCD-TR930 Hi8**

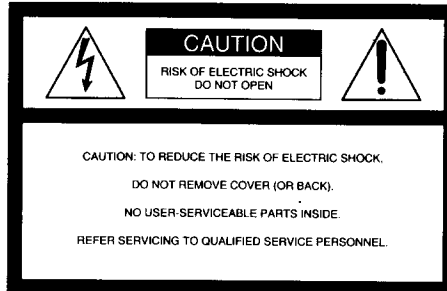
©1997 by Sony Corporation

## Welcome!

Congratulations on your purchase of this Sony Handycam® camcorder. With your Handycam, you can capture life's precious moments with superior picture and sound quality. Your Handycam is loaded with advanced features, but at the same time it is very easy to use. You will soon be producing home video that you can enjoy for years to come.

## WARNING

**To prevent fire or shock hazard, do not expose the unit to rain or moisture.**



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

### DISPOSAL OF LITHIUM ION BATTERY.

#### LITHIUM ION BATTERY. DISPOSE OF PROPERLY.

You can return you unwanted lithium ion batteries to your nearest Sony Service Center or Factory Service Center.

**Note:** In some areas the disposal of lithium ion batteries in household or business trash may be prohibited.

For the Sony Service Center nearest you call  
1-800-222-SONY (United States only)

For the Factory Service Center nearest you call  
416-499-SONY (Canada only)

**Caution:** Do not handle damaged or leaking lithium ion battery.

## For the Customers in the U.S.A.

### CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

#### Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## For the customers in CANADA

### CAUTION

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

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## Before you begin

# Using this manual

As you read through this manual, buttons and settings on the camcorder are shown in capital letters.

e.g. Set the POWER switch to CAMERA.

As indicated with  in the illustrations, you can hear the beep sound to confirm your operation.

## Note on TV color systems

TV color systems differ from country to country. To view your recordings on a TV, you need an NTSC system-based TV.

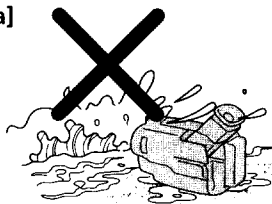
## Precaution on copyright

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

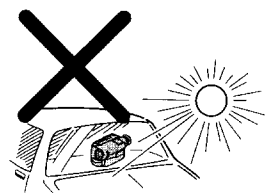
## Precautions on camcorder care

- The LCD screen and/or the color viewfinder are manufactured using high-precision technology. However, there may be some tiny black points and/or bright points (red, blue or green in color) that constantly appear on the LCD screen or in the viewfinder. These points are normal in the manufacturing process and do not affect the recorded picture in any way. Over 99.99% are operational for effective use.
- Do not let the camcorder get wet. Keep the camcorder away from rain and sea water. Letting the camcorder get wet may cause the unit to malfunction, and sometimes this malfunction cannot be repaired [a].
- Never leave the camcorder exposed to temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight [b].

[a]



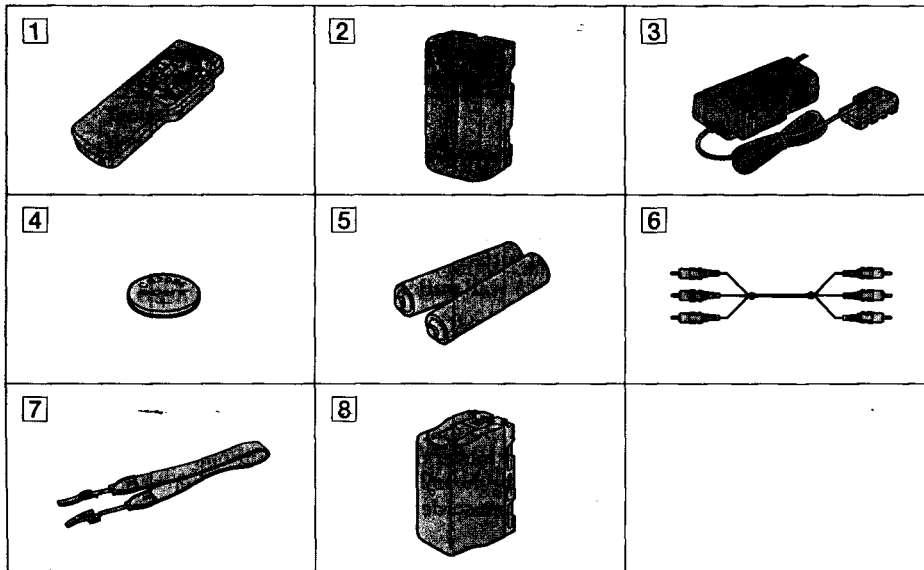
[b]



Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

# Checking supplied accessories

Check that the following accessories are supplied with your camcorder.



Before you begin

- |   |   |
|---|---|
| <b>1 Wireless Remote Commander</b> (1) (p.66)   | <b>5 Size AA (R6) battery for Remote Commander</b> (2) (p.67) |
| <b>2 NP-F330 Battery pack</b> (1) (p.6)   | <b>6 A/V connecting cable</b> (1) (p.18, 44)                  |
| <b>3 AC-V316/V316A AC power adaptor</b> (1) (p.6, 22)   | <b>7 Shoulder strap</b> (1) (p.68)                            |
| <b>4 CR2025 Lithium Battery</b> (1) (p.46)<br>The lithium battery is already installed in your camcorder. | <b>8 Battery case</b> (1) (p.23)                              |

## Getting started

# Charging and installing the battery pack

Before using your camcorder, you first need to charge and install the battery pack. To charge the battery pack, use the supplied AC power adaptor.

This camcorder operates with the "InfoLITHIUM" battery. If you use any other battery to operate your camcorder, the camcorder may not operate or the battery life may be shortened.

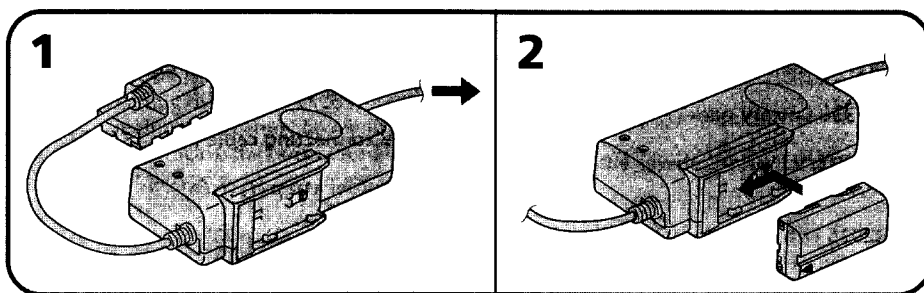
"InfoLITHIUM" is a trade mark of Sony Corporation.

## Charging the battery pack

Charge the battery pack on a flat surface without vibration.

- (1) Connect the power cord to a wall outlet.
- (2) Align the surface of the battery pack indicated by the ► mark with the edge of the terminal shutter of the AC power adaptor. Then fit and slide the battery pack in the direction of the arrow. The CHARGE lamp (orange) lights up. Charging begins.

When the CHARGE lamp goes out, **normal charge** is completed. For **full charge**, which allows you to use the battery longer than usual, leave the battery pack in place for approximately one hour. Unplug the unit from the wall outlet, then remove the battery pack and install it into the camcorder. You can also use the battery pack before it is completely charged.



## Charging time

Battery pack	NP-F330 (supplied)	NP-F530	NP-F730	NP-F930
Charging time* (min.)	160 (100)	170 (110)	250 (190)	330 (270)

The time required for a normal charge is indicated in parentheses.

\* Approximate minutes to charge an empty battery pack using the supplied AC power adaptor (full charge). (Lower temperatures require a longer charging time.)

## Charging and installing the battery pack

### Battery life

Battery pack	NP-F330 (supplied)	NP-F530	NP-F730	NP-F930
Continuous recording time* (min.)	70 (65)	150 (135)	305 (275)	480 (435)
Typical recording time* (min.)	40 (35)	85 (75)	170 (155)	270 (245)

Numbers before the parentheses indicate the time when you use a fully charged battery. Numbers in the parentheses indicate the time when you use a normal charged battery.

\* Approximate continuous recording time indoors.

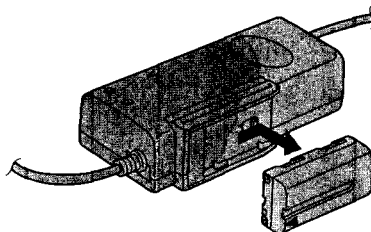
\*\* Approximate minutes when recording while you repeat recording start/stop, zooming and turning the power on/off. The actual battery life may be shorter.

### Note on remaining battery time indication during recording

Remaining battery time is displayed in the viewfinder. It may not be displayed properly, however, depending on the conditions and circumstances of use.

### To remove the battery pack

Slide the battery pack in the direction of the arrow.



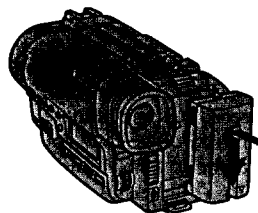
### Notes on charging the battery pack

- The CHARGE lamp will remain lit for a while even if the battery pack is removed and the power cord is unplugged after charging the battery pack. This is normal.
- If the CHARGE lamp does not light, disconnect the power cord. After about one minute, reconnect the power cord again.
- You cannot operate the camcorder using the AC power adaptor while charging the battery pack.
- When a fully charged battery pack is installed, the CHARGE lamp will light once, then go out.

## Charging and installing the battery pack

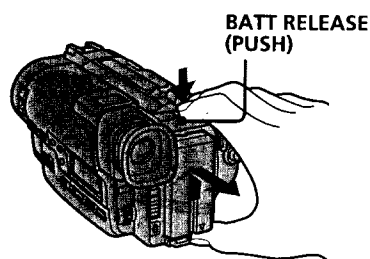
### Installing the battery pack

Align the grooves of the battery pack with the receptacles of the camcorder and slide the battery pack down until it catches on the battery release lever and clicks. Attach the battery pack to the camcorder securely.



### To remove the battery pack

While pressing the BATT (battery) RELEASE (PUSH) button, slide the battery pack in the direction of the arrow.



You can look at the demonstration of the functions available with this camcorder (p.26).

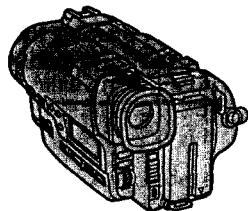


## Charging and installing the battery pack

### Using the camcorder with the finder all down or lifted up

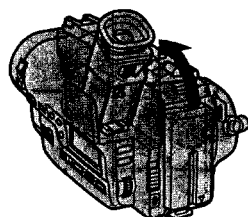
#### When NP-F730 or NP-F930 is installed

When you install NP-F730 or NP-F930, slide out the viewfinder for more comfortable camera recording.



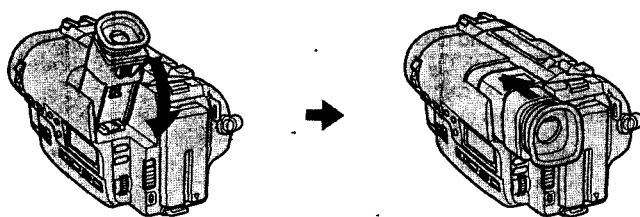
#### When you record in a low angle

Lift up the viewfinder.



#### To restore the viewfinder

Push the viewfinder down or slide it into the camcorder.



#### Note on the battery pack

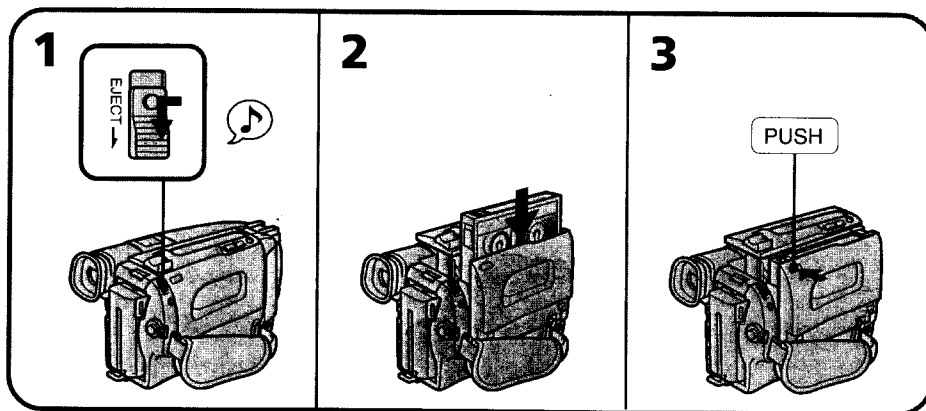
Do not carry the camcorder by grasping the battery pack.

Getting started

## Inserting a cassette

Make sure that the power source is installed. When you want to record in the Hi8 system, use Hi8 video cassette **Hi8**.



- (1) While pressing the small blue button on the EJECT switch, slide it in the direction of the arrow. The cassette compartment automatically lifts up and opens.
- (2) Insert a cassette with the window facing out.
- (3) Close the cassette compartment by pressing the PUSH mark on the cassette compartment. The cassette compartment automatically goes down.



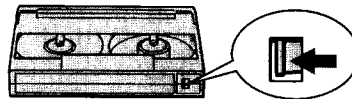
### To eject the cassette

While pressing the small blue button on the EJECT switch, slide it in the direction of the arrow.

### To prevent accidental erasure

Slide the tab on the cassette to expose the red mark. If you insert the cassette with the red mark exposed and close the cassette compartment, the beeps sound for a while. If you try to record with the red mark exposed, the  and  indicators flash in the viewfinder, and you cannot record.

To re-record on this tape, slide the tab back out covering the red mark.



# Camera recording

Make sure that the power source is installed, a cassette is inserted and that the START/STOP MODE switch is set to . Before you record one-time events, you may want to make a trial recording to make sure that the camcorder is working correctly.

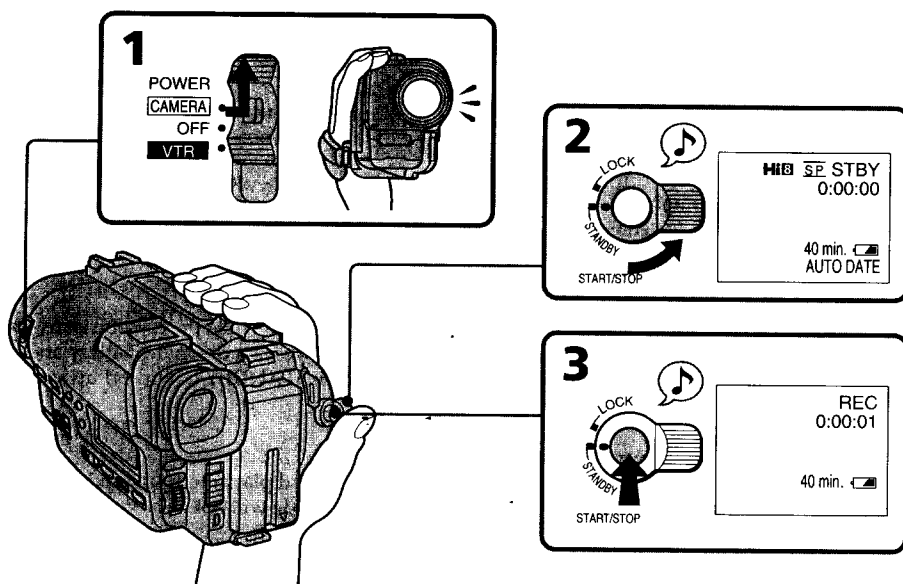
When you use the camcorder for the first time, power on it and reset the date and time to your time before you start recording. (p.47)

The date is automatically recorded for 10 seconds after you start recording (**AUTO DATE feature**). This feature works only once a day.

To save battery power, the picture in the viewfinder appears only when you bring your face close to the viewfinder with **STANDBY up (Finder power save)**.

- (1) While pressing the small green button on the POWER switch, set it to CAMERA.
- (2) Turn **STANDBY up**.
- (3) Press **START/STOP**. The camcorder starts recording. The "REC" indicator appears. The camera recording/battery lamps located on the front light up. The **AUTO DATE** indicator appears.

You can also select Recording mode, SP (standard play) mode or LP (long play) mode. Set **REC MODE** in the menu system according to the length of your planned recording before you start.

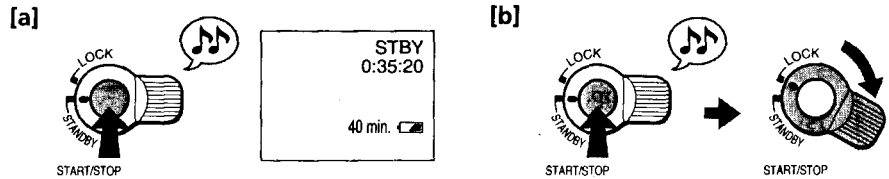


### To stop recording momentarily [a]

Press START/STOP again. The "STBY" indicator appears in the viewfinder (Standby mode).

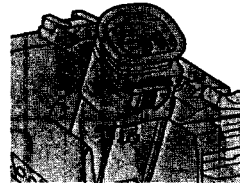
### To finish recording [b]

Press START/STOP again. Turn STANDBY down and set the POWER switch to OFF. Then, eject the cassette and remove the battery pack.



### To focus the viewfinder lens

If you cannot see the indicators in the viewfinder clearly, or after someone else has used the camcorder, focus the viewfinder lens. Turn the viewfinder lens adjustment lever so that the indicators in the viewfinder come into sharp focus.



### Note on the lighting aperture

If direct sunlight enters the lighting aperture, the picture in the viewfinder appears brighter. When this happens, colors in the viewfinder may change.

### Note on Standby mode

If you leave the camcorder in Standby mode for 5 minutes while the cassette is inserted, the camcorder turns off automatically. This prevents wearing down the battery and wearing out the tape. To resume Standby mode, turn STANDBY down and up again. To start recording, press START/STOP.

### Notes on recording mode

- This camcorder records and plays back in SP (standard play) mode and in LP (long play) mode. However, the playback quality in LP mode will not be as good as that in SP mode.
- When you record a tape in LP mode on this camcorder, we recommend you to play the tape on this camcorder. When you play back the tape on other camcorders or VCRs, noise may occur on a picture or sound. Noise may occur also when you play on this camcorder the tape recorded in LP mode on other camcorders or VCRs.

### Note on recording


When you record from the beginning of a tape, run the tape for about 15 seconds before starting the actual recording. This will ensure that you won't miss any start-up scenes when you play back the tape.

## Camera recording

### Notes on the tape counter

- The tape counter indicates the recording or playback time. Use it as a guide. There will be a time lag of several seconds from the actual time. To set the counter to zero, press COUNTER RESET.
- If the tape is recorded in SP and LP modes mixed, the tape counter shows incorrect recording time. When you intend to edit the tape using the tape counter as a guide, record in same (SP or LP) mode.

### Note on the beep sound

As indicated with  in the illustration, a beep sounds when you turn the power on or when you start recording, and two beeps sound when you stop recording, confirming the operation. Several beeps also sound as a warning of any unusual condition of the camcorder.

Note that the beep sound is not recorded on the tape. If you do not want to hear the beep sound, select "OFF" in the menu system.

### Note on the AUTO DATE feature

The clock is set to East Coast Standard Time at the factory. You can reset the clock in the menu system. You can change the AUTO DATE settings by selecting ON or OFF in the menu system. The AUTO DATE feature shows the date automatically once a day.

However, the date may automatically appear more than once a day when:

- you reset the date and time.
- you eject and insert the tape again.
- you stop recording within 10 seconds.
- you set AUTO DATE to OFF once and set it to ON again in the menu system.

### Notes on finder power save

- The recording continues even when the picture in the viewfinder disappears during recording.
- If you set VF PW-SAVE to off in the menu system, the picture in the viewfinder does not disappear even when you turn your face away from the viewfinder.

### When moving from indoors to outdoors (or vice versa)

Turn STANDBY up and point the camcorder at a white object for about 15 seconds so that the white balance is properly adjusted.

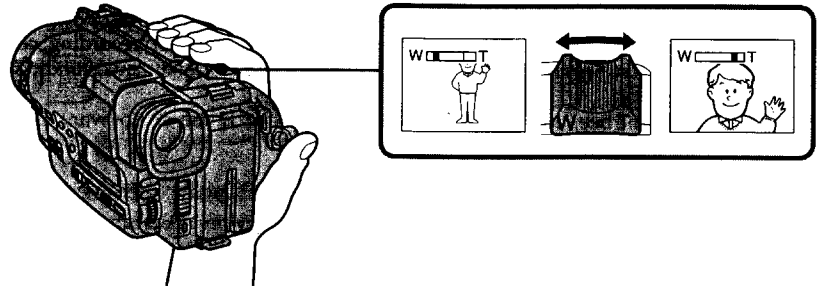
### Using the zoom feature

Zooming is a recording technique that lets you change the size of the subject in the scene.

For more professional-looking recordings, use the zoom function sparingly.

"T" side: for telephoto (subject appears closer)

"W" side: for wide-angle (subject appears farther away)



### Zooming speed (Variable speed zooming)

Move the power zoom lever a little for a slower zoom, move it further for a faster zoom.

#### When you shoot a subject using a telephoto zoom

If you cannot get a sharp focus while in extreme telephoto zoom, move the power zoom lever to the "W" side until the focus is sharp. You can shoot a subject that is at least about  $2\frac{5}{8}$  feet (about 80cm) away from the lens surface in the telephoto position, or about  $\frac{1}{2}$  inch (about 1cm) away in the wide-angle position.

#### Notes on digital zoom


- More than 15x zoom is performed digitally (x30), and the picture quality deteriorates as you go toward the "T" side. If you do not want to use the digital zoom, set the D ZOOM function to OFF in the menu system.
- The right side [a] in the power zoom indicator shows the digital zooming zone, and the left side [b] shows the optical zooming zone. If you set the D ZOOM function to OFF, the [a] zone disappears.




### Selecting the START/STOP mode

Your camcorder has two modes besides normal start/stop mode. These modes enable you to take a series of quick shots resulting in a lively video.

(1) Set the START/STOP MODE switch to the desired mode.

 : Recording starts when you press START/STOP, and stops when you press it again (normal mode).

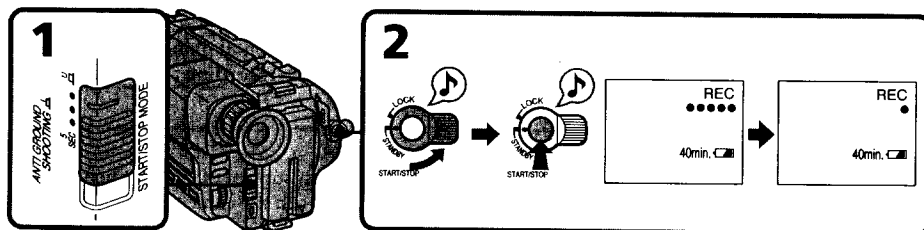
ANTI GROUND SHOOTING  : The camcorder records only while you press down START/STOP so that you can avoid recording unnecessary scenes.

5 SEC: When you press START/STOP, the camcorder records for 5 seconds and then stops automatically.

(2) Turn STANDBY up and press START/STOP. Recording starts.

If you selected 5 SEC, five dots appear in the viewfinder. The dots disappear at a rate of one per second. When five seconds elapse and all the dots disappear, the camcorder switches to Standby mode automatically.


Basic operations




### To extend the recording time in 5 SEC mode

Press START/STOP again before all the dots disappear. Recording continues for about 5 seconds from the moment you pressed START/STOP.

### To return to normal recording

Set the START/STOP MODE switch to . If you set the switch while recording, recording continues.

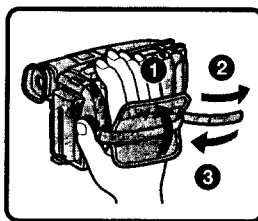
### Note on 5-SEC and ANTI GROUND SHOOTING mode

You cannot use FADER if you select 5 SEC or ANTI GROUND SHOOTING .

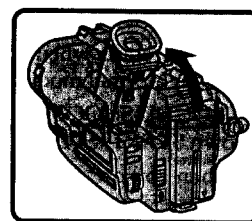
## Hints for better shooting

For hand-held shots, you'll get better results by holding the camcorder according to the following suggestions:

[a]



[b]



- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the controls with your thumb [a].
- Place your right elbow against your side.
- Place your left hand under the camcorder to support it. Be sure not to touch the built-in microphone.
- Place your eye firmly against the viewfinder eyecup.
- Use the viewfinder frame as a guide to determine the horizontal plane.
- You can also record in a low position to get an interesting recording angle. Lift the viewfinder up to record from a low position [b].

### Place the camcorder on a flat surface or use a tripod

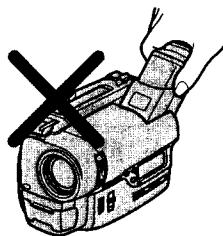
Try placing the camcorder on a table top or any other flat surface of suitable height. If you have a tripod for a still camera, you can also use it with the camcorder.

When attaching a non-Sony tripod, make sure that the length of the tripod screw is less than  $\frac{9}{32}$  inch (6.5 mm). Otherwise, you cannot attach the tripod securely and the screw may damage the camcorder.

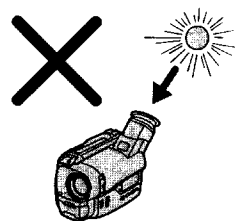
### Cautions on the viewfinder

- Do not pick up the camcorder by the viewfinder [c].
- Do not place the camcorder so as to point the viewfinder toward the sun. The inside of the viewfinder may be damaged. Be careful when placing the camcorder under sunlight or by a window [d].

[c]



[d]





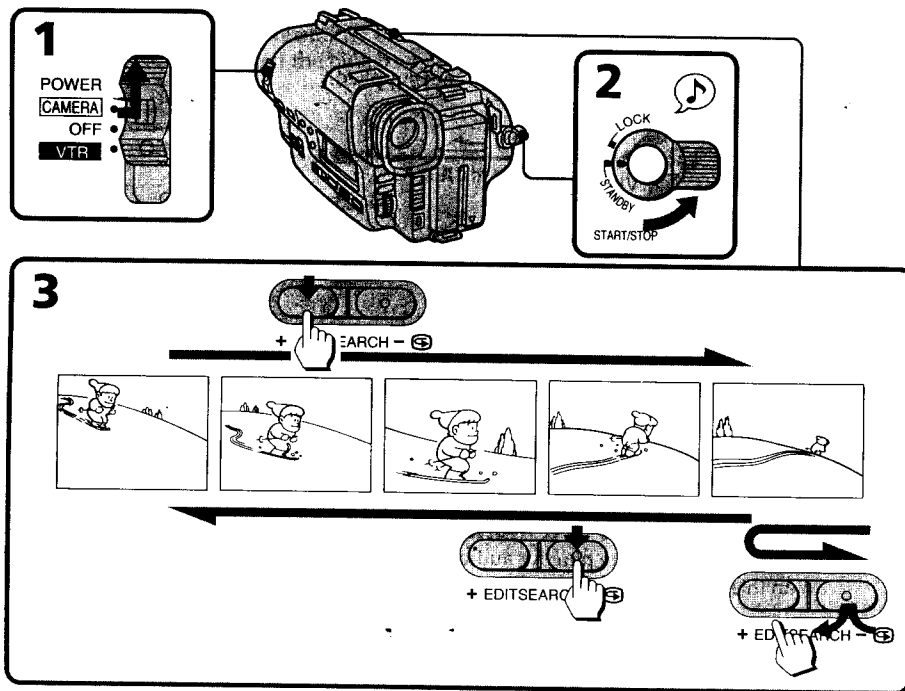
# Checking the recorded picture

Using EDITSEARCH, you can review the last recorded scene or check the recorded picture in the viewfinder.

- (1) While pressing the small green button on the POWER switch, set it to CAMERA.
- (2) Turn STANDBY up.
- (3) Press the - (Ⓢ) side of EDITSEARCH momentarily; the last few seconds of the recorded portion play back (**Rec Review**).

You can monitor the sound from the headphones.

Hold down the - side of EDITSEARCH until the camcorder goes back to the scene you want. The last recorded portion is played back. To go forward, hold down the + side (**Edit Search**).



## To stop playback

Release EDITSEARCH.

## To begin re-recording

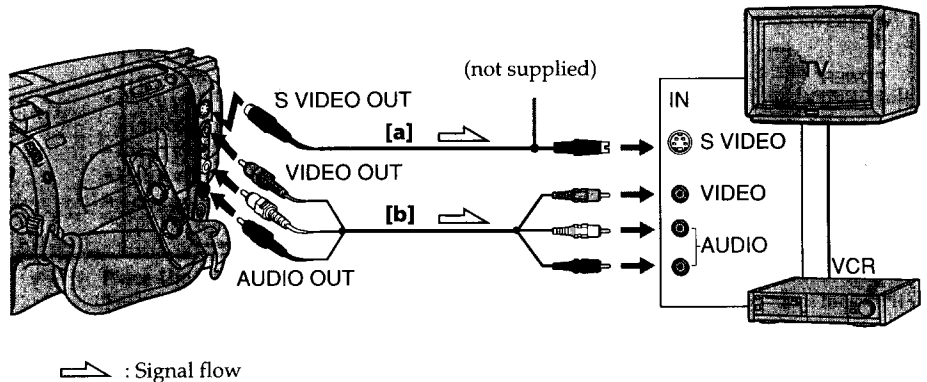
Press START/STOP. Re-recording begins from the point you released EDITSEARCH. Provided you do not eject the cassette, the transition between the last scene you recorded and the next scene you record will be smooth.

## Connections for playback

You can use this camcorder as a VCR by connecting it to your TV for playback. There are some ways to connect the camcorder to your TV. When monitoring the playback picture by connecting the camcorder to your TV, we recommend you to use house current for the power source.

### Connecting directly to a VCR/TV with Video/Audio input jacks

Open the jack cover. If your TV is already connected to a VCR, connect the camcorder to the LINE IN inputs on the VCR by using the supplied A/V connecting cable. Set the input selector on the VCR to LINE. Set the TV/VCR selector on the TV to VCR. If your VCR or TV has an S video jack, connect using the S video cable (not supplied) [a] to obtain a high quality picture.



If you are going to connect the camcorder using the S video cable (not supplied) [a], you do not need to connect the yellow (video) plug of the A/V connecting cable [b].

#### If your VCR or TV is a monaural type



Connect only the white plug for audio on both the camcorder and the VCR or the TV. With this connection, the sound is monaural even in stereo mode.


#### To connect to a VCR or TV without Video/Audio input jacks

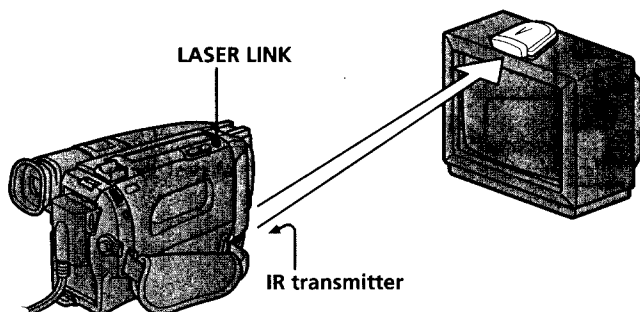
Use the RFU-95UC RFU adaptor (not supplied).

## Playing back a tape

### Using the AV cordless IR receiver - LASER LINK

Once you connect the AV cordless IR receiver (not supplied) having the  LASER LINK mark to your TV or VCR, you can easily view the picture on your TV. For details, refer to the instruction manual of the AV cordless IR receiver. LASER LINK is a system which transmits and receives a picture and sound between video equipment having the  mark by using infrared rays. LASER LINK is a trademark of Sony Corporation.

- (1) Connect the receiver to the TV, and turn on the IR receiver power.
- (2) Turn on the TV power, and set the TV/VCR selector on the TV to VCR.
- (3) Set the POWER switch to VTR and press LASER LINK on the camcorder. The LASER LINK button indicator lights up.
- (4) Press  on the camcorder. The picture appears on the TV screen.
- (5) Point the IR transmitter on the camcorder toward the infrared sensor on the IR receiver so that the blue background clearly appears on the TV.



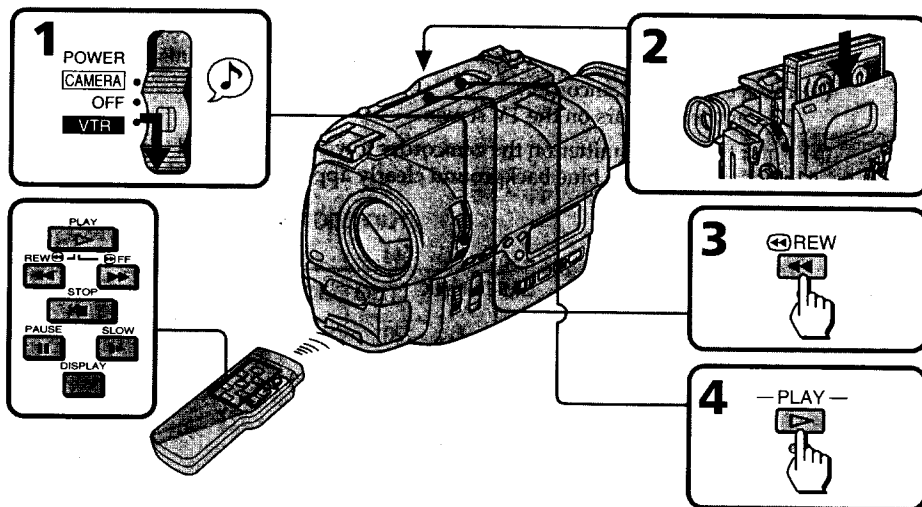
#### To cancel the LASER LINK function

Press LASER LINK.

## Playing back a tape

You can monitor the playback picture in the viewfinder. You can also monitor a picture on a TV screen, after connecting the camcorder to a TV or VCR.

- (1) While pressing the small green button on the POWER switch, set it to VTR. The video control buttons light up.
- (2) Insert the recorded tape with the window facing out.
- (3) Press ◀◀ to rewind the tape.
- (4) Press ▶▶ to start playback.



To stop playback, press □.

To rewind the tape, press ◀◀.

To fast-forward the tape rapidly, press ▶▶.

### Using the remote commander

You can control playback using the supplied Remote Commander. Before using the Remote Commander, insert the size AA (R6) batteries.

### To display the viewfinder screen indicators on the TV

Press DISPLAY on the Remote Commander. To erase the indicators, press DISPLAY again.

### To monitor the sound while viewing the playback picture in the viewfinder

Connect headphones (not supplied) to the ◯ jack.

### Note on the lens cover

The lens cover does not open when the POWER switch is set to VTR. Do not open the lens cover manually. It may cause malfunction.

## Playing back a tape

### Various playback modes

#### To view a still picture (playback pause)

Press **II** during playback. To resume playback, press **II** or **▷**.

#### To locate a scene (picture search)

Keep pressing **◀◀** or **▶▶** during playback. To resume normal playback, release the button.

#### To monitor the high-speed picture while advancing the tape or rewinding (skip scan)

Keep pressing **◀◀** while rewinding or **▶▶** while advancing the tape. To resume normal playback, press **▷**.

#### To view the picture at 1/5 speed (slow playback)

Press **1/5** on the Remote Commander during playback. To resume normal playback, press **▷**. If slow playback lasts for about 1 minute, it shifts to normal speed automatically.

#### To select the playback sound

Change the "HiFi SOUND" mode setting in the menu system.

#### Notes on playback

- Streaks appear and the sound is muted in the various playback modes.
- When playback pause mode lasts for 5 minutes, the camcorder automatically enters stop mode.

## Using alternative power sources

You can choose any of the following power sources for your camcorder: battery pack, the house current, alkaline battery and 12/24 V car battery. Choose the appropriate power source depending on where you want to use your camcorder.

Place	Power source	Accessory to be used
Indoors	House current	Supplied AC power adaptor
Outdoors	Battery pack	InfoLITHIUM battery NP-F330 (supplied), NP-F530, NP-F730, NP-F930
	Size AA (LR6) Alkaline battery	Battery case (supplied)
In the car	12 V or 24 V car battery	Sony car battery charger DC-V515A

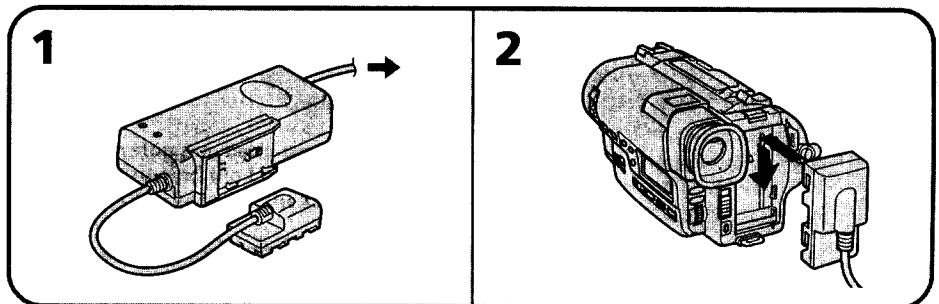
### Note on power sources

Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If this happens, restore the power supply again immediately.

## Using the house current

To use the supplied AC power adaptor:

- (1) Connect the AC power cord to a wall outlet.
- (2) Slide the connecting plate down into the guides at the rear of the camcorder until it clicks.



### To remove the connecting plate

The connecting plate is removed in the same way as battery pack.

### WARNING

The power cord must only be changed at a qualified service shop.

### PRECAUTION

The set is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the set itself has been turned off.

### Notes on the VTR/CAMERA lamp

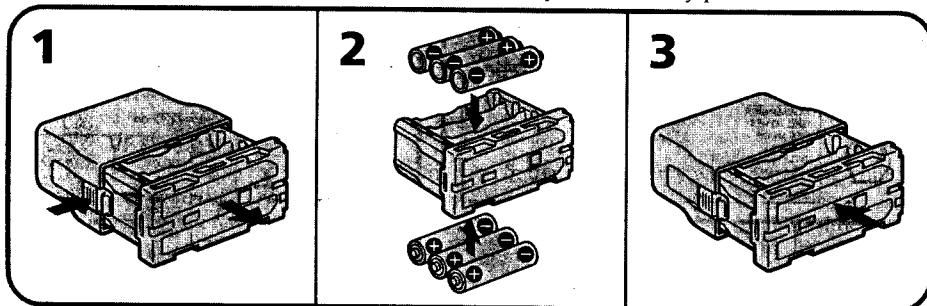
- The VTR/CAMERA lamp will remain lit for a while even if the unit is unplugged after use. This is normal.
- If the VTR/CAMERA lamp does not light, disconnect the power cord. After about one minute, reconnect the power cord.

## Using alternative power sources

### Using alkaline batteries

Use the battery case (supplied) and six size AA (LR6) Sony Alkaline batteries (not supplied).

- (1) Remove the battery holder from the battery case.
- (2) Insert six new alkaline batteries into the battery holder, following the marking on the holder to be sure the batteries are installed in the correct direction.
- (3) Insert the battery holder with the alkaline batteries.
- (4) Insert the battery case with the alkaline batteries to the battery mounting surface of the camcorder in the same way as the battery pack.



Advanced Operations

### Battery Life

Using alkaline batteries at 77°F (25°C).

Continuous recording time	165 min.
Typical recording time	95 min.

#### Notes

- You may not use the battery case in cold environment.
- The battery life may be shorter depending on the using environment.
- The above battery lives are estimates. The battery life may be shorter depending on the storage condition of the battery before being purchased and temperature.

### When the battery case is installed

Slightly raise the viewfinder when you use the camcorder.

### To remove the battery case

The battery case is removed in the same way as the battery pack.

When you replace the batteries, be sure to remove the battery case from the camcorder to prevent malfunction.

### Using a car battery

Use Sony DC-V515A car battery charger (not supplied). Connect the car battery cord to the cigarette lighter socket of a car (12 V or 24 V). Connect the car battery charger and to the camcorder in the same way as you connect the AC power adaptor.

### To remove the car battery charger

The car battery charger is removed in the same way as the AC power adaptor.



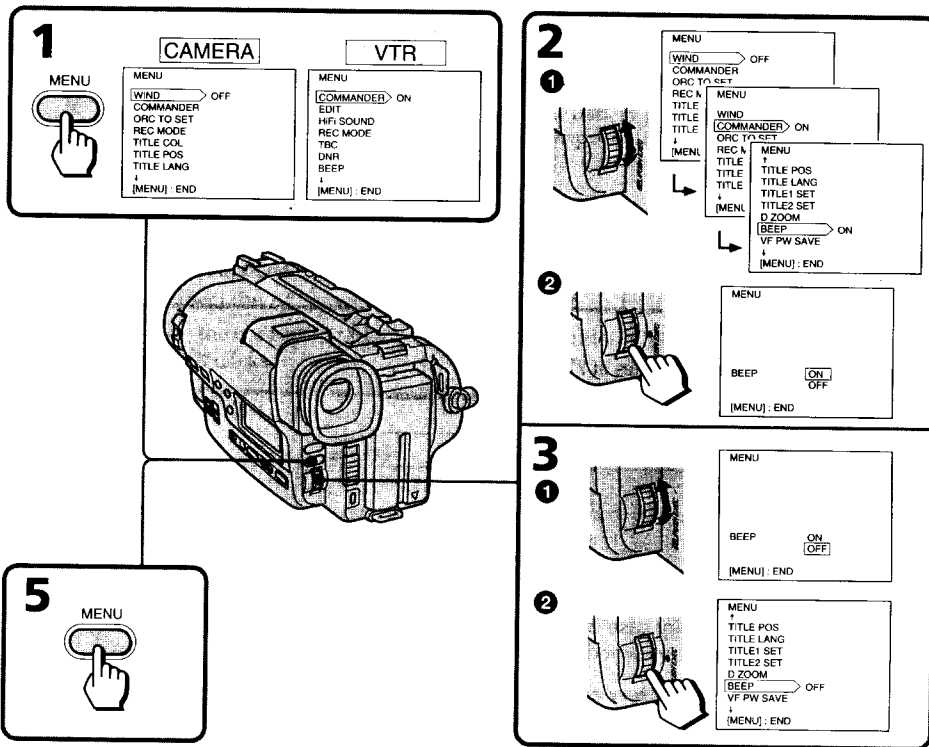
This mark indicates that this product is a genuine accessory for Sony video products.

When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

## Changing the mode settings

You can change the mode settings in the menu system to further enjoy the features and functions of the camcorder.

- (1)** Press MENU to display the menu.
- (2)** Turn the control dial to select the desired item, then press the dial.
- (3)** Turn the control dial to select the desired mode, then press the dial. If you want to change the other modes, repeat steps 2 and 3.
- (4)** Press MENU to erase the menu display.





## Changing the mode settings

### Selecting the mode setting of each item

#### Items for both CAMERA and VTR modes

##### COMMANDER <ON/OFF>

- Select ON when using the supplied Remote Commander for the camcorder.
- Select OFF when not using the Remote Commander.

##### REC MODE\* <SP/LP>

- Select SP when recording in SP (standard play) mode.
- Select LP when recording in LP (long play) mode.

##### BEEP\* <ON/OFF>

- Select ON so that beeps sound when you start/stop recording, etc.
- Select OFF when you do not want to hear the beep sound.

##### VF PW-SAVE\* <ON/OFF>

- Select ON so that the picture in the viewfinder appears only when you bring your face close to the viewfinder.
- Select OFF when you want to display the picture in the viewfinder all the time.

#### Items for CAMERA mode only

##### WIND <ON/OFF>

- Select ON to reduce wind noise when recording in strong wind.
- Normally select OFF.

##### ORC TO SET\* <ORC ON>

Select this item and press the START/STOP button to automatically adjust the recording condition to get the best possible recording. If you have already perform this function, "ORC ON" is displayed.

##### TITLE COL\* <WHITE/YELLOW/VIOLET/RED/CYAN/GREEN/BLUE>

Select the color of the title.

##### TITLE POS\* <CENTER/BOTTOM>

- Select CENTER to center the title in the picture.
- Select BOTTOM to position the title at the bottom of the picture.

##### TITLE LANG\* <ENGLISH/FRANÇAIS/ESPAÑOL/PORTUGUÊS>

Select the language of the preset titles.

##### TITLE 1 SET\* TITLE 2 SET\*

Select to store your own original titles.

##### D ZOOM\* <ON/OFF>

- Select ON to activate digital zooming.
- Select OFF not to use the digital zoom. The camera goes back to 15x zoom.

##### REC LAMP\* <ON/OFF>

- Select OFF when you do not want the camera recording/battery lamp at the front of the unit to light up.
- Normally select ON.

## Changing the mode settings

### **AUTO DATE\* <ON/OFF>**

- Select ON to record the date for 10 seconds after recording has started.
- Select OFF not to record the date.

### **CLOCK SET\***

Select this item to reset the date or time.

### **DEMO MODE\* <ON/OFF>**

- Select ON to make the demonstration appear without cassette.
- Select OFF to deactivate the demonstration mode.

#### **Notes on DEMO MODE**

- DEMO MODE is set to STBY (Standby) at the factory and the demonstration starts about 10 minutes after you set the POWER switch to CAMERA without inserting a cassette. Note that you cannot select STBY or DEMO MODE in the menu system.
- You cannot select DEMO MODE when a cassette is inserted in the camcorder.
- If you insert a cassette during the demonstration, the demonstration stops. You can start recording as usual. DEMO MODE automatically returns to STBY.

#### **To look at the demonstration at once**

Eject the cassette, if inserted. Select ON of DEMO MODE and erase the menu display. The demonstration will begin. When you turn off the camcorder once, DEMO MODE automatically returns to STBY.

## **Items for VTR mode only**

### **EDIT <ON/OFF>**

- Select ON to minimize picture deterioration when editing.
- Normally select OFF.

### **HiFi SOUND <STEREO/1/2>**

- Normally select STEREO.
- Select 1 or 2 to play back a dual sound track tape.

### **TBC\* <ON/OFF>**

- Select ON to correct for jitter.
- Select OFF not to correct for jitter.

The picture may not be steady when played back.

#### **Note on TBC setting**

Set TBC to OFF when playing back:

- A tape you have dubbed over.
- A tape on which you recorded the signal of a TV game or similar machine.

If the playback picture fluctuates while you hold the camcorder, set TBC to OFF.

### **DNR\* <ON/OFF>**

- Select ON to reduce noise.
- Select OFF to not reduce noise.

#### **The following settings work only during playback**

EDIT, HiFi SOUND, TBC, and DNR.

\* These settings are retained even when the battery is removed, as long as the lithium battery is in place.

# Fade-in and fade-out

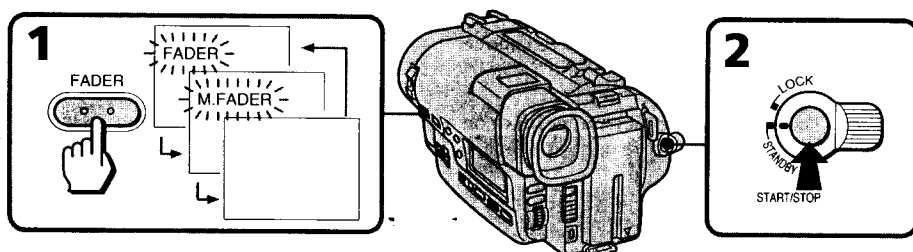
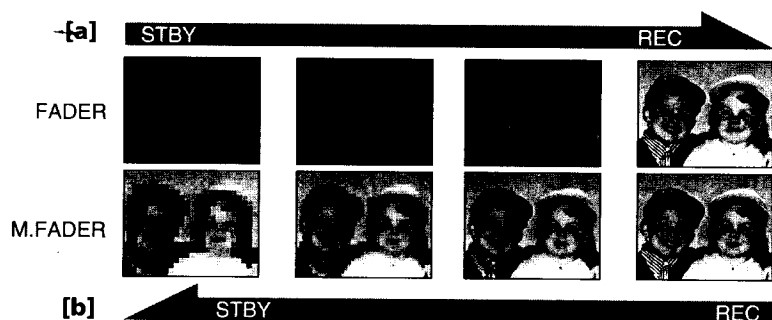
You can fade in or out to give your recording a professional appearance. When fading in, the picture gradually fades in from black or mosaic while the sound increases. When fading out, the picture gradually fades to black or mosaic while the sound decreases.

## When fading in [a]

- (1) While the camcorder is in Standby mode, press FADER. The fade indicator starts flashing.
- (2) Press START/STOP to start recording. The fade indicator stops flashing.

## When fading out [b]

- (1) During recording, press FADER. The fade indicator starts flashing.
- (2) Press START/STOP to stop recording. The fade indicator stops flashing, and then recording stops.



## To cancel the fade-in/fade-out function

Before pressing START/STOP, press FADER until the fade indicator disappears.

## When the date or time indicator is displayed

The date or time indicator does not fade in or fade out.

## Notes on titles

- While fading in or fading out, you cannot superimpose a title.
- While a title is displayed, the picture does not fade in or out.

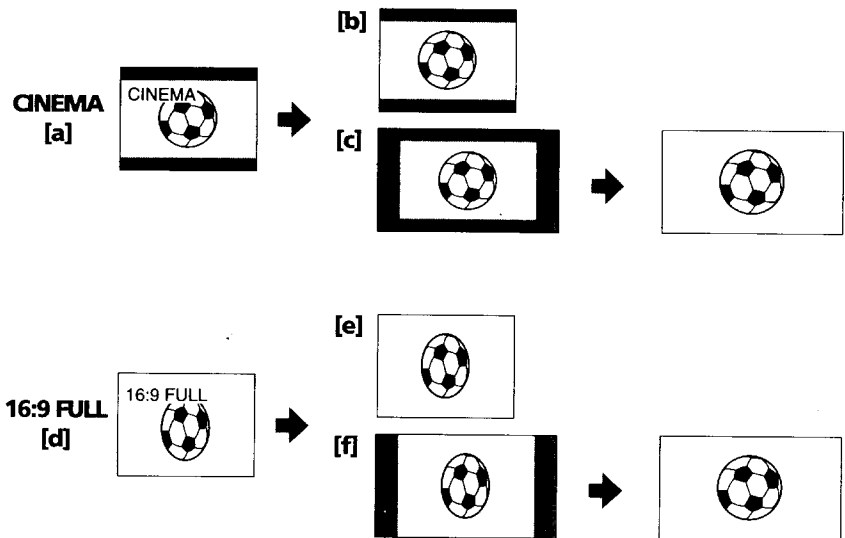
## When START/STOP MODE is set to 5SEC or ANTI GROUND SHOOTING

You cannot use the fader function.

## Using the wide mode function

### Selecting the desired mode

You can record a cinemalike picture (CINEMA) or a 16:9 wide picture to watch on the 16:9 wide-screen TV (16:9 FULL).



#### CINEMA

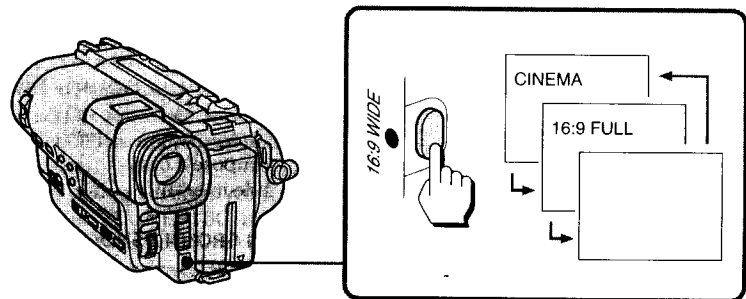
Black bands appear at the top and the bottom of the screen, and the viewfinder **[a]** and a normal TV screen **[b]** look wide. You can also watch the picture without black bands on a wide-screen TV **[c]**. When you select the CINEMA mode, DATE, TIME and the battery indicators are displayed above.

#### 16:9 FULL

The picture in the viewfinder **[d]** or on a normal TV **[e]** is horizontally compressed. You can watch the picture of normal images on a wide-screen TV **[f]**.

### Using the wide mode function

While the camcorder is in Standby mode, press 16:9 WIDE repeatedly so that the desired mode indicator appears in viewfinder. While recording, you cannot change the mode.



## Using the wide mode function

### To cancel wide mode

Press 16:9 WIDE repeatedly until the wide mode indicator disappears.

### To watch the tape recorded in wide mode

To watch the tape recorded in CINEMA mode, set the screen mode of the wide-screen TV to zoom mode. To watch the tape recorded in 16:9 FULL mode, set it to full mode. For details, refer to the instruction manual of your TV.

Note that the picture recorded in 16:9 FULL mode looks compressed on a normal TV.

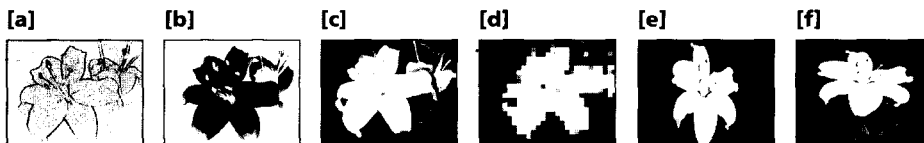
### Notes on wide mode

- If wide mode is set to 16:9 FULL, the Steady Shot function does not work and the "S" indicator flashes.
- When you record in 16:9 FULL mode, the date or time indicator will be widened on the wide-screen TV.
- If you dub a tape, the tape is copied in the same mode as the original recording.
- The wide mode is canceled automatically 5 minutes after you remove the power source.
- When recording, you cannot change the mode.

## Enjoying picture effect

### Selecting picture effect

You can make pictures like those of television with the Picture Effect function.



#### PASTEL [a]

Emphasize contrast and gives picture animation-like colors.

#### NEG. ART [b]

The color and brightness of the picture is reversed.

#### SEPIA

The picture is sepia.

#### B&W

The picture is monochrome (black and white).

#### SOLARIZE [c]

The light intensity is more clear, and the picture looks like an illustration.

#### MOSAIC [d]

The picture is mosaic.

#### SLIM [e]

The picture expands vertically.

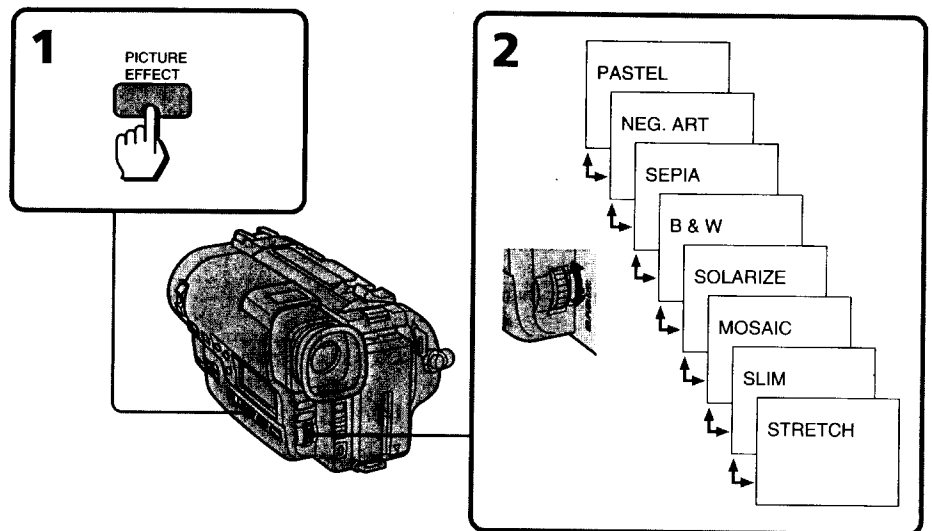
#### STRETCH [f]

The picture expands horizontally.

## Enjoying picture effect

### Using picture effect function

- (1) Press PICTURE EFFECT.
- (2) Turn the control dial to select the desired picture effect mode.



### To turn off picture effect

Press PICTURE EFFECT. The indicator in the viewfinder goes out.

### Note on the picture effect

When you turn the power off, the camcorder returns automatically to normal mode.

# Focusing manually

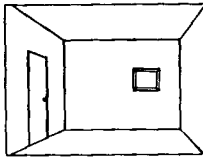
## When to use manual focus

In the following cases you should obtain better results by adjusting the focus manually.

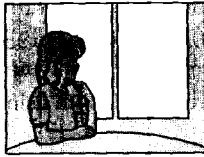
[a]



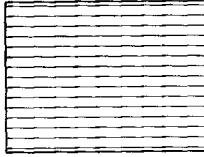
[b]



[c]



[d]




- Insufficient light [a]
- Subjects with little contrast — walls, sky, etc. [b]
- Too much brightness behind the subject [c]
- Horizontal stripes [d]
- Subjects through frosted glass
- Subjects beyond nets, etc.
- Bright subject or subject reflecting light
- Shooting a stationary subject when using a tripod

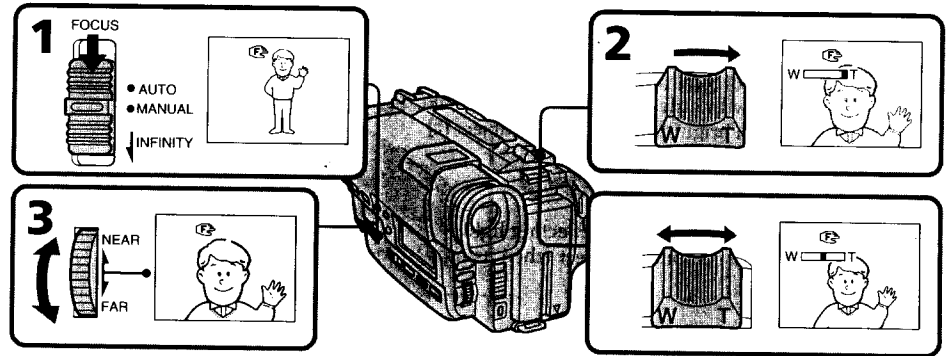
Advanced Operations

## Focusing manually


### Focusing manually

When focusing manually, first focus in telephoto before recording, and then reset the shot length.

- (1) Set FOCUS to MANUAL. The  indicator appears in the viewfinder.
- (2) Move the power zoom lever to the "T" side until the lever reaches the end.
- (3) Turn the NEAR/FAR dial to achieve a sharp focus. Be sure not to touch the built-in microphone when you turn the NEAR/FAR dial.
- (4) Set the desired shot length using the power zoom lever.



#### To return to autofocus mode

Set FOCUS to AUTO. The  indicator in the viewfinder disappears.

#### Shooting in relatively dark places



Shoot at wide-angle after focusing in the telephoto position.

#### To record a very distant subject

Push FOCUS down to INFINITY. The lens focuses on the most distant subject while FOCUS is held down. When it is released, manual focus mode is resumed. Use this function when shooting through a window or a screen, to focus on a most distant subject.

#### Note on manual focusing

The following indicators may appear:

- : when recording a very distant subject.
- : when the subject is too close to focus on.



# Using the PROGRAM AE function

## Selecting the best mode

You can select one of six PROGRAM AE (Auto Exposure) modes to suit your shooting situation, referring to the following.



### ● Spotlight mode

For subjects in spotlight, such as at the theatre or a formal event.

### ● Soft portrait mode

For zooming in on a still subject in telephoto mode, or for a subject behind an obstacle such as a screen. Creates a soft background for subjects such as people or flowers, and faithfully reproduces skin color.

### ● Sports lesson mode

For recording fast-moving subjects such as in tennis or golf games.

### ● Beach & ski mode

For people or faces in strong light or reflected light, such as at a beach in midsummer or on a snowy winter mountain.

### ● Sunset & moon mode

For recording subjects in dark environments such as sunsets, fireworks, neon signs, or general night views.

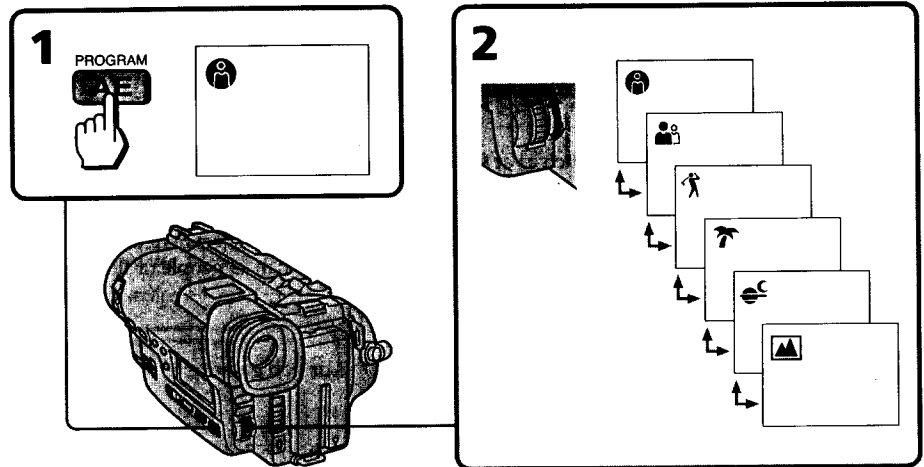
### ● Landscape mode

For distant subjects such as mountains or when recording a subject behind an obstacle such as a window or screen.

## Using the PROGRAM AE function

### Using the PROGRAM AE function

- (1) Press PROGRAM AE.
- (2) Turn the control dial to select the desired PROGRAM AE mode.



### To turn off program AE

Press PROGRAM AE.

#### Notes on focus setting


- In the Spotlight, Sports lesson and Beach & Ski modes, you cannot take close-ups because the camcorder is set to focus only on subjects in the middle to far distance.
- In the Sunset & Moon and Landscape modes, the camcorder is set to focus only on distant subjects.

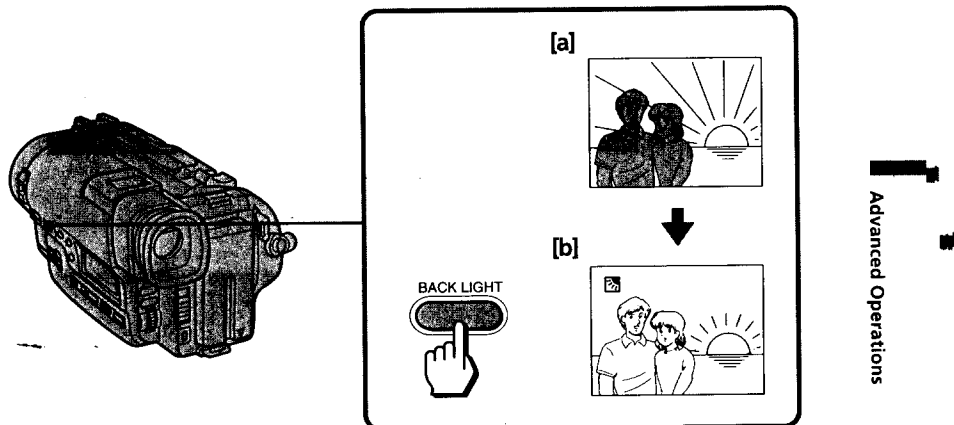
#### Note on PROGRAM AE

You can adjust the exposure while recording using PROGRAM AE mode.

# Shooting with backlighting

When you shoot a subject with the light source behind the subject or a subject with a light background, use the BACK LIGHT function.


Press BACK LIGHT. The  indicator appears in the viewfinder.



[a] Subject is too dark because of backlight.

[b] Subject becomes bright with backlight compensation.

## After shooting

Be sure to release this adjustment condition by pressing BACK LIGHT again. The  indicator disappears. Otherwise, the picture will be too bright under normal lighting condition.

This function is also effective under the following conditions:

- On snow, e.g. at a ski resort
- At the beach under strong sunshine
- A subject with a light source nearby or a mirror reflecting light
- A white subject against a white background. Especially when you shoot a person wearing shiny clothes made of silk or synthetic fiber, his or her face tends to become dark if you do not use this function.

## To make a fine adjustment

You can adjust the exposure manually. However, when you adjust the exposure manually, BACK LIGHT does not operate.

# Adjusting the exposure

## When to adjust the exposure

Adjust the exposure manually under the following cases.

[a]



[b]



[a]

- The background is too bright (back lighting)
- Insufficient light: most of the picture is dark

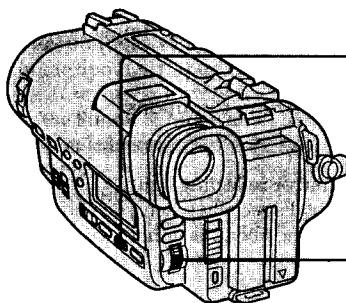
[b]

- Bright subject and dark background
- To record the darkness faithfully

## Adjusting the exposure

(1) Press EXPOSURE.

(2) Turn the control dial to adjust the brightness.

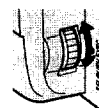


1

EXPOSURE



2



### To return to automatic exposure mode

Press EXPOSURE again.

#### Shooting with the sun behind you

If the light source is behind your subject, or in the following situations, the subject will be recorded too dark.

- The subject is indoors and there is a window behind the subject.
- Bright light sources are included in the scene.
- When shooting a person wearing white or shiny clothes in front of a white background, the face will be recorded too dark.

## Adjusting the exposure

### Shooting in the dark

We recommend you to use a video light (not supplied). To get the best color, you must maintain a sufficient light level.

### When you adjust the exposure manually

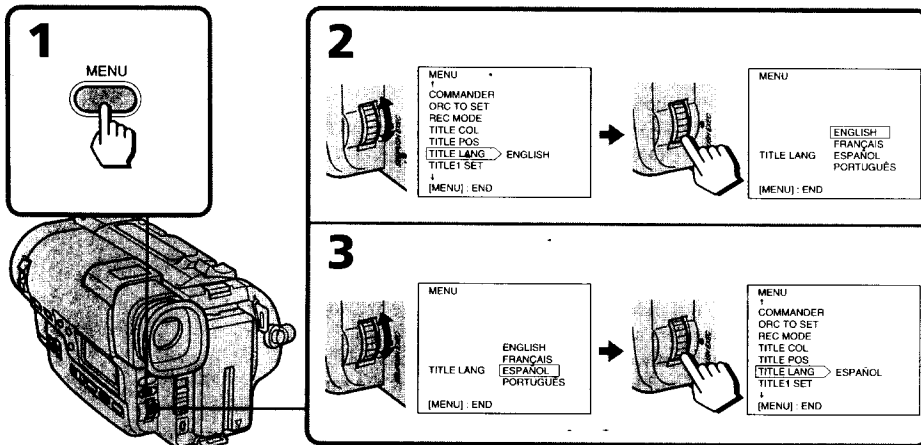
- BACK LIGHT does not appear.
- If you press PROGRAM AE, the camcorder automatically returns to automatic exposure mode.

## Superimposing a title

You can select one of eight preset titles. You can also select the language, position, and color of titles in the menu system.

### Selecting the language

- (1) While the camcorder is in Standby mode, press MENU to display the menu.
- (2) Turn the control dial to select TITLE LANG, then press the dial.
- (3) Turn the control dial to select the desired language, then press the dial.
- (4) Press MENU to erase the menu display.



## Superimposing a title

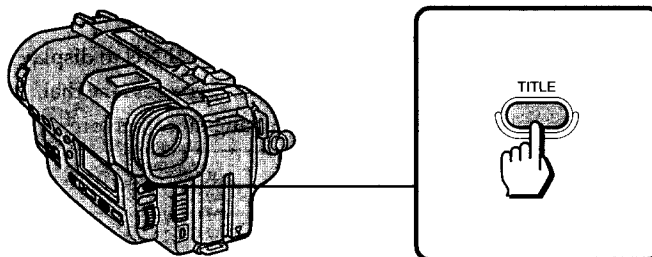
### Using titles

#### To add the title from the beginning

- (1) While the camcorder is in Standby mode, press TITLE repeatedly until the desired title appears.  
Each time a new title appears, it flashes. When the desired title appears, wait for it to stop flashing.
- (2) Press START/STOP to start recording.
- (3) When you want to stop recording the title, press TITLE.

#### To add the title while you are recording

- (1) While the camcorder is in Standby mode, press TITLE repeatedly until the desired title appears.  
Each time a new title appears, it flashes.
- (2) When the desired title appears, wait for it to stop flashing, and press TITLE again to erase the title from the display.
- (3) Press START/STOP to start recording.
- (4) When you reach the point where you want to add the title, press TITLE.
- (5) When you want to stop recording the title, press TITLE again.



#### Titles cycle as follows:

Original title 1 → Original title 2 → HELLO! → HAPPY BIRTHDAY → HAPPY HOLIDAYS → CONGRATULATIONS! → OUR SWEET BABY → WEDDING → VACATION → THE END

After "THE END" the title indicator goes off once and returns to Original title 1 again. The titles are displayed in the language you selected in the menu system.

#### Notes on superimposing a title

- If you have not made any original titles, they are not displayed.
- You cannot select a title while you are recording.
- FADER does not work while the title is displayed.
- A title, a date and time cannot be recorded at the same time.
- When fading in or out you cannot display a title.
- If you display the menu while superimposing a title, the title is not recorded while the menu is being displayed.

## Superimposing a title

### To select the color of the title


- (1) While the camcorder is in Standby mode, press MENU to display the menu.
- (2) Turn the control dial to select TITLE COL, then press the dial.
- (3) Turn the control dial to select the desired color, then press the dial.  
You can choose from the following 7 colors:  
WHITE ↔ YELLOW ↔ VIOLET ↔ RED ↔ CYAN ↔ GREEN ↔ BLUE
- (4) Press MENU to erase the menu display.

### To select the position of the title

- (1) While the camcorder is in Standby mode, press MENU to display the menu.
- (2) Turn the control dial to select TITLE POS, then press the dial.
- (3) Turn the control dial to select the desired position (CENTER or BOTTOM), then press the dial.
- (4) Press MENU to erase the menu display.

Advanced Operations

**1**



**2**

**TITLE COL**

MENU  
↑  
WIND  
COMMANDER  
ORC TO SET  
REC MODE  
TITLE COL → WHITE  
TITLE POS  
TITLE LANG  
↓  
[MENU] END

**TITLE POS**

MENU  
↑  
COMMANDER  
ORC TO SET  
REC MODE  
TITLE COL  
TITLE POS → CENTER  
TITLE LANG  
TITLE1 SET  
↓  
[MENU] END

**2**

MENU  
↑  
WHITE  
YELLOW  
VIOLET  
RED  
CYAN  
GREEN  
BLUE  
TITLE COL  
↓  
[MENU] END

MENU  
↑  
TITLE POS  
→ CENTER  
BOTTOM  
↓  
[MENU] END

**3**

MENU  
↑  
WHITE  
YELLOW  
VIOLET  
RED  
CYAN  
GREEN  
BLUE  
TITLE COL  
↓  
[MENU] END

MENU  
↑  
TITLE POS  
→ CENTER  
BOTTOM  
↓  
[MENU] END

**2**

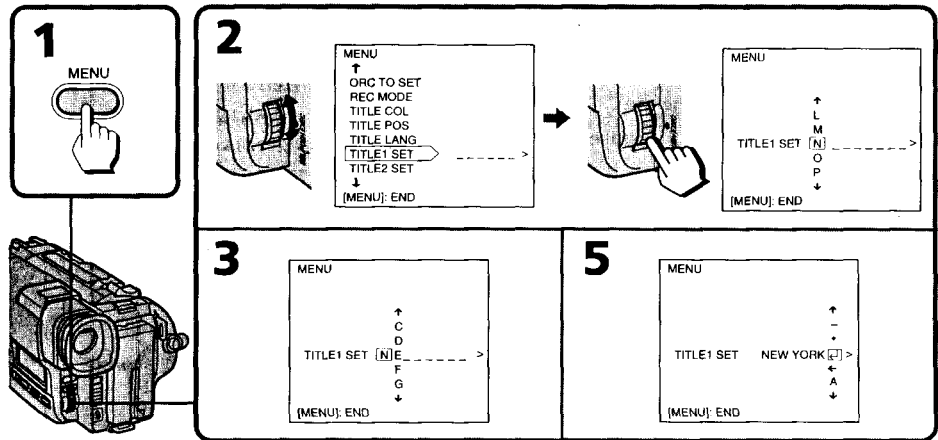
MENU  
↑  
WIND  
COMMANDER  
ORC TO SET  
REC MODE  
TITLE COL → GREEN  
TITLE POS  
TITLE LANG  
↓  
[MENU] END

MENU  
↑  
COMMANDER  
ORC TO SET  
REC MODE  
TITLE COL  
TITLE POS → BOTTOM  
TITLE LANG  
TITLE1 SET  
↓  
[MENU] END

# Making your own titles

You can make up to two titles and store them in the camcorder. Eject the cassette before you begin. Your title can have up to 22 letters.

- (1) While the camcorder is in Standby mode, press MENU to display the menu.
- (2) Turn the control dial to select TITLE1 SET or TITLE2 SET, then press the dial.
- (3) Turn the control dial to select the desired character, then press the dial.  
To move the cursor to the character on the left side, select ←.
- (4) Repeat step 3 until you finish the title.
- (5) When you are finished, turn the control dial to select ↵, then press the dial.
- (6) Press MENU to erase the menu display.



## To edit the title you have stored

In step 2, select TITLE 1 SET or TITLE 2 SET, whichever title you want to edit is stored in. Then change the title.

## If you do nothing more than 5 minutes while a cassette is in the camcorder

The power goes off automatically. Turn STANDBY down once, turn it again up and proceed from step 1.

## When you enter 22 letters in step 4

The title is stored automatically. (You do not need to go to step 5.)

## To delete a title

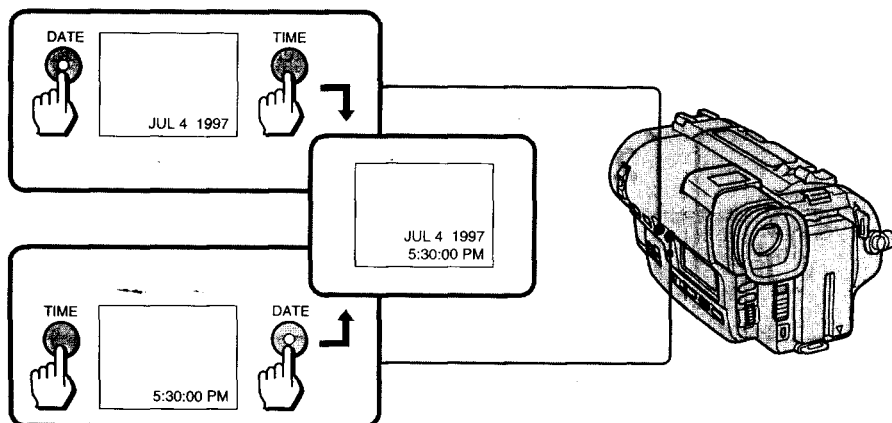
At the leftmost character position, select ← and press the control dial. Do not erase the title by selecting empty spaces. If you do so, a title full of empty spaces is stored.



## Recording with the date/time

Before you start recording or during recording, press DATE or TIME. You can record the date or time displayed in the viewfinder with the picture. Press DATE (or TIME), then press TIME (or DATE) to display date and time together.

The clock is already set to East Coast Standard Time at the factory. You can reset the clock in the menu system.



Advanced Operations

### To stop recording with the date and/or time

Press DATE and/or TIME again. The date and/or time indicator disappears. The recording continues.

#### Note on the date or time indicator

If you press DATE or TIME while you are recording in CINEMA mode, the indicators in the viewfinder move upwards.

## Optimizing the recording condition

Use this feature to check the tape condition before recording, so that you can get the best possible picture (ORC).

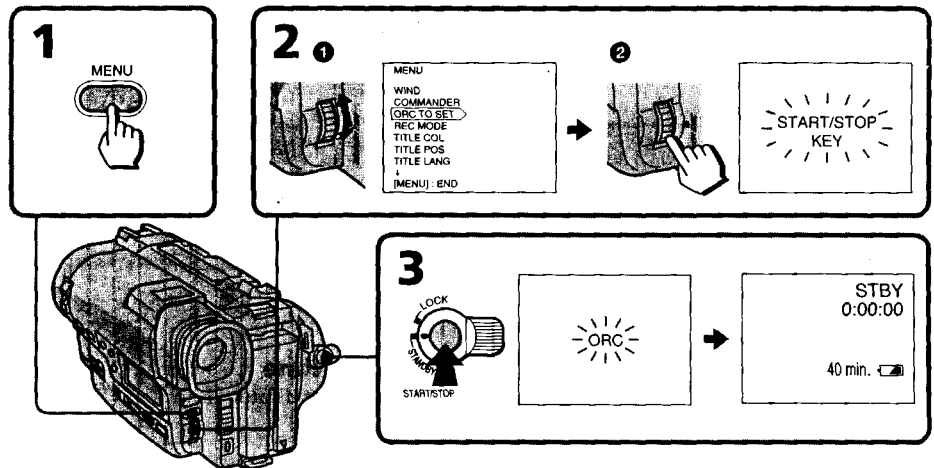
(1) While the camcorder is in Standby mode, press MENU to display the menu.

(2) Turn the control dial to select ORC TO SET, then press the dial.

"START/STOP KEY" starts flashing.

(3) Press START/STOP.

The ORC indicator starts flashing. The camcorder takes about 10 seconds to check the tape condition and then returns to Standby mode.



### If the cassette has been ejected

Every time you eject the cassette, ORC is canceled. Set ORC again.

### To check if you have performed ORC

If the ORC indicator lights up in the display window, the tape condition has been checked.

### Notes on the ORC function

- When you set ORC TO SET, the recording on the tape is erased for about 0.1 second so that the camcorder can check the tape condition. Be careful when you use a recorded tape. The 0.1 second blank is erased if you record from the point where you set ORC TO SET for more than 2 seconds, or if you record over the blank.
- You cannot use this function on a tape with the red mark on the cassette exposed.
- While the ORC function is turned on, you cannot operate the power zoom lever.

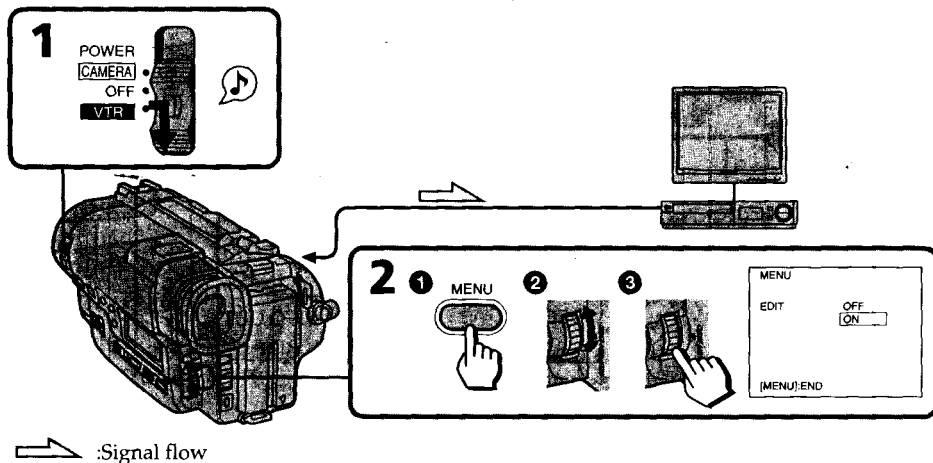
## Editing onto another tape

You can create your own video program by editing with any other 8 mm, Hi8, Hi8V, VHS, S-VHS, VHSC, S-VHSC, Betamax or ED Betamax VCR that has video/audio inputs.

### Before editing

Connect the camcorder to the VCR using the supplied A/V connecting cable. Set the input selector on the VCR to LINE, if available.

- (1) While pressing the small green button on the POWER switch, slide it to VTR.
- (2) Set EDIT to ON in the menu system.



Advanced Operations

### Starting editing

- (1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert your recorded tape into the camcorder.
- (2) Play back the recorded tape on the camcorder until you locate the point where you want to start editing, then press II to set the camcorder in playback pause mode.
- (3) On the VCR, locate the recording start point and set the VCR in recording pause mode.
- (4) Press II on the camcorder and VCR simultaneously to start editing.

#### To edit more scenes

Repeat steps 2 to 4.

#### To stop editing

Press □ on both the camcorder and the VCR.

#### Note on the DISPLAY function


If you have displayed the viewfinder screen indicators on the TV, erase the indicators by pressing DISPLAY on the Remote Commander so that they will not be superimposed on the edited tape.

#### Note on Fine Synchro Edit

If you connect a video deck that has the Fine Synchro Edit feature to the LANC jack of the camcorder, using a LANC cable (not supplied), the edit will be even more precise.

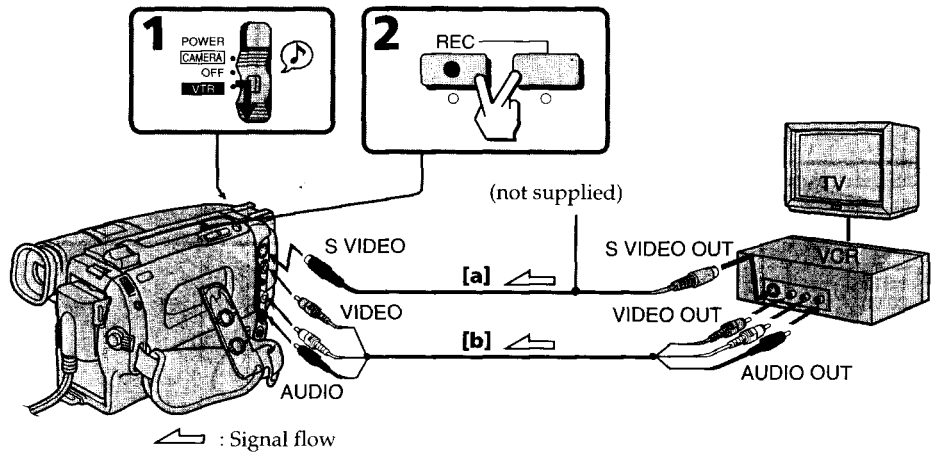
## Recording from a VCR or TV

You can record a tape from another VCR or a TV program from a TV that has audio/video outputs. Connect the camcorder to the VCR or TV.

- (1) While pressing the small green button on the POWER switch, slide it to VTR.
- (2) Press REC  and the button on the right together at the point where you want to start recording.

In recording and recording pause mode, S VIDEO and VIDEO/AUDIO jacks automatically work as input jacks.



If your VCR or TV has an S video jack, connect using the S video cable (not supplied) [a] to obtain a high quality picture.



If your VCR or TV is a monaural type, connect only the white plug for audio on both the camcorder and the VCR or TV.

If you are going to connect the camcorder using the S video cable (not supplied) [a], you do not need to connect the yellow (video) plug of the A/V connecting cable [b].


### To check the picture from a VCR or TV before recording

Press  after pressing . You can check the picture in the viewfinder.


### To stop recording

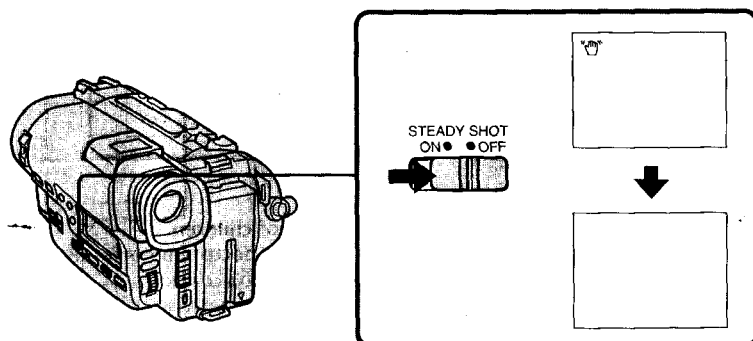
Press .

## Releasing the STEADY SHOT function

When you shoot, the  indicator appears in the viewfinder. This indicates that the Steady Shot function is working and the camcorder compensates for camera-shake.


You can release the Steady Shot function when you do not need to use the Steady Shot function. Do not use the Steady Shot function when shooting a stationary object with a tripod.

Set STEADY SHOT to OFF. The  indicator goes off.




Advanced Operations


### To activate the Steady Shot function again

Set STEADY SHOT to ON. The  indicator appears in the viewfinder.

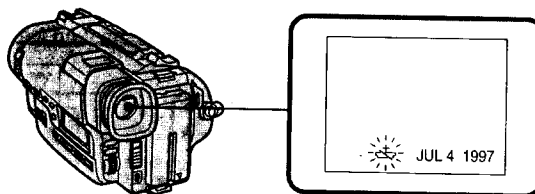
#### Notes on the Steady Shot function

- The Steady Shot function will not correct excessive camera-shake.
- When you switch the Steady Shot function on or off, the exposure may fluctuate.
- Steady Shot does not operate when you select the 16:9 FULL mode. If you set STEADY SHOT to ON, the  indicator flashes.

## Changing the lithium battery in the camcorder

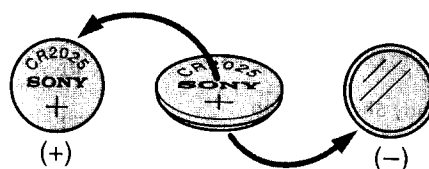
Your camcorder is supplied with a lithium battery installed. When the battery becomes weak or dead, the  indicator flashes in the viewfinder for about 5 seconds when you set the POWER switch to CAMERA. In this case, **replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of any other battery may present a risk of fire or explosion.** Discard used batteries according to the manufacturer's instructions.

The lithium battery for the camcorder lasts for about 1 year under normal operation. (The lithium battery that comes installed at the factory may not last 1 year.)



### Notes on lithium battery

- Keep the lithium battery out of the reach of children.  
Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure a good contact.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Note that the lithium battery has a positive (+) and a negative (-) side as illustrated.  
Be sure to insert the lithium battery with the positive side facing out.



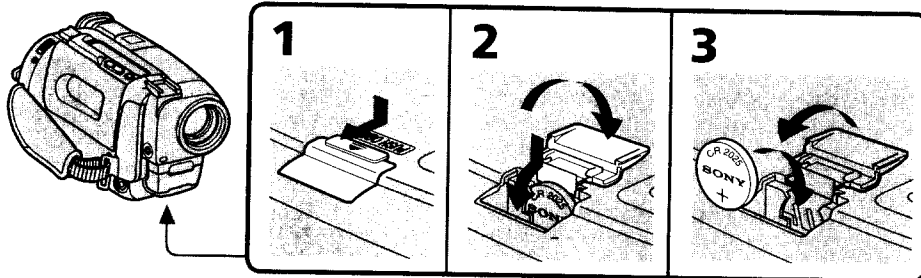
### WARNING

The battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire.

### Changing the lithium battery

When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you will need to reset the date, time and other items in the menu system retained by the lithium battery.

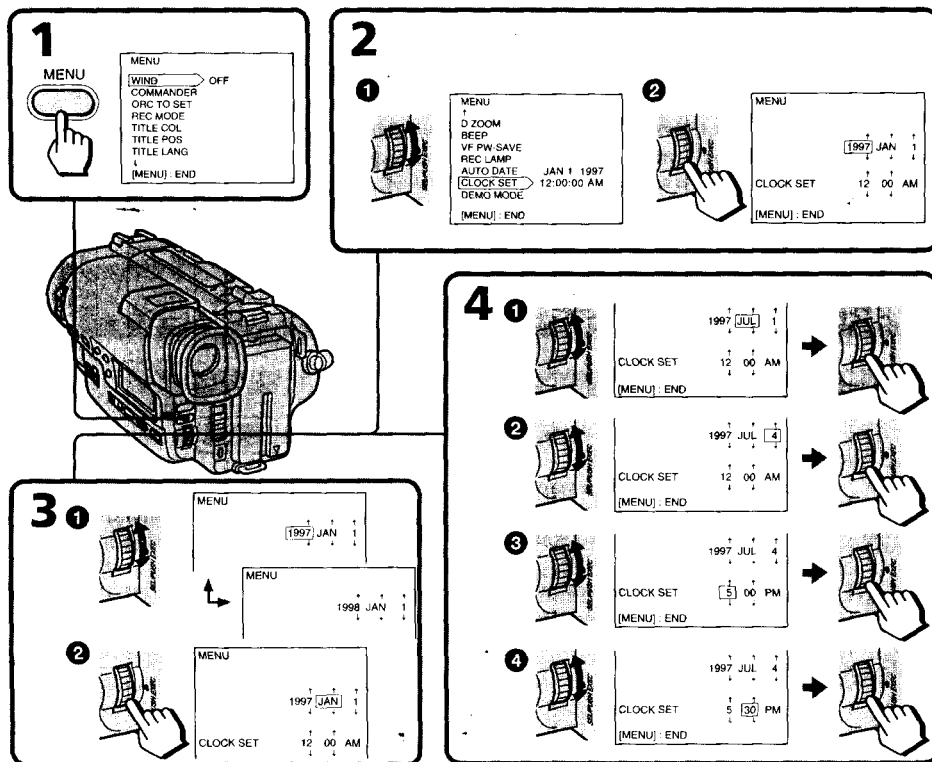
- (1) Open the lid of the lithium battery compartment.
- (2) Push the lithium battery down once and pull it out from the holder.
- (3) Install the lithium battery with the positive (+) side facing out. Close the lid.



# Resetting the date and time

You can set the date and time in the menu system.

- (1) Press MENU to display the menu in the viewfinder.
- (2) Turn the control dial to select CLOCK SET, then press the dial.
- (3) Turn the control dial to adjust the year, and then press the dial.
- (4) Set the month, day, hour and minutes by turning the control dial and then pressing the dial.
- (5) Press MENU to erase the menu display.



Additional Information

## To correct the date and time setting

Repeat the above procedure.

## Resetting the date and time

### To check the preset date and time

Press DATE to display the date indicator in the viewfinder.

Press TIME to display the time indicator.

When you press the same button again, the indicator goes off.

### The year indicator changes as follows:

1997 ↔ 1998 ↔ ... ↔ 2029

### Note on the time indicator

The internal clock of this camcorder operates on a 12-hour cycle.

- 12:00 AM stands for midnight.
- 12:00 PM stands for noon.

## Usable cassettes and playback modes

### Selecting cassette types

This Hi8 system is an extension of the standard 8 mm system, and was developed for higher-quality pictures.

You can use Hi8 video and standard 8 mm cassettes. When you use a Hi8 video cassette, the recording is in the Hi8 system. When you use a standard 8mm cassette, the recording is in the standard 8 mm system. You cannot record on standard 8 mm cassettes in the Hi8 system.

If you are going to play back the tape using a standard 8mm video recorder/player, you should use standard 8 mm cassettes.

### When you play back

The playback mode (SP/LP) and system (Hi8/standard 8 mm) are selected automatically according to the format in which the tape has been recorded. The quality of the recorded picture in LP mode, however, will not be as good as that in SP mode.

### Note on AFM HiFi stereo

When you play back a tape, the sound will be in monaural if:

- You record the tape using this camcorder, then play it back on an AFM HiFi monaural video recorder/player.
- You record the tape on an AFM HiFi monaural video recorder, then play it back on this camcorder.

### Foreign 8 mm video

Because the TV color systems differ from country to country, you may not be able to play back foreign pre-recorded tapes. Refer to the list of "Using your camcorder abroad" to check the TV color system of foreign countries.



# Tips for using the battery pack

This section shows you how you can get the most out of your battery pack.

## Preparing the battery pack

### Always carry additional batteries

Have sufficient battery pack power to do 2 to 3 times as much recording as you have planned.

### Battery life is shorter in a cold environment

Battery efficiency is decreased, and the battery will be used up more quickly, if you are recording in a cold environment.

### To save battery power


Turn STANDBY down when not recording to save battery power.


A smooth transition between scenes can be made even if recording is stopped and started again. While you are positioning the subject, selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

## When to replace the battery pack

While you are using your camcorder, the remaining battery indicator in the viewfinder decreases gradually as battery power is used up. The remaining time in minutes also appears.



When the remaining battery indicator reaches the lowest point, the  indicator appears and starts flashing in the viewfinder.

When the  indicator in the viewfinder changes from slow flashing to rapid flashing while you are recording, slide the POWER switch to OFF on the camcorder and replace the battery pack. Leave the tape in the camcorder to obtain a smooth transition between scenes after the battery pack has been replaced.

## Notes on the rechargeable battery pack

### Caution

Never leave the battery pack in temperatures above 140°F (60°C), such as in a car parked in the sun or under direct sunlight.

### The battery pack heats up

During charging or recording, the battery pack heats up. This is caused by energy that has been generated and a chemical change that has occurred inside the battery pack. This is not cause for concern and is normal.

## Tips for using the battery pack

### Battery pack care

- Remove the battery pack from the camcorder after using it, and keep it in a cool place. When the battery pack is installed to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF. This shortens battery life.
- The battery pack is always discharging even when it is not in use after charging. Therefore, you should charge the battery pack right before using the camcorder.

### Be sure to observe the following

- Keep the battery pack away from fire.
- Keep the battery pack dry.
- Do not open nor try to disassemble the battery pack.
- Do not expose the battery pack to any mechanical shock.

### The switch on the battery pack

When the switch is supplied with the battery pack you can use it to find whether the battery pack is charged or not. Set the switch to the "green mark" position when charging is completed. (When removed from the charging adaptor, the switch exposes the green mark. When removed from your camcorder, no mark is indicated.)



### The life of the battery pack


If the battery indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.


### Charging temperature

You should charge batteries at temperatures from 50°F to 86°F (from 10°C to 30°C). Lower temperatures require a longer charging time.

## Notes on the "InfoLITHIUM" battery pack

### What is the "InfoLITHIUM"

The "InfoLITHIUM" is a lithium ion battery pack which can exchange data with compatible video equipment about its battery consumption. Sony recommends that you use the "InfoLITHIUM" battery pack with video equipment having the  InfoLITHIUM mark.

When you use this battery pack with video equipment having the  InfoLITHIUM mark, the video equipment will indicate the remaining battery time in minutes\*. However, if you use it with video equipment not having this mark, the remaining battery capacity will not be indicated in minutes.


\* The indication may not be accurate depending on the condition and environment which the equipment is used under.

## Tips for using the battery pack

### How the battery consumption is displayed



The power consumption of the camcorder changes depending on its use, such as how the autofocus is working.

While checking the condition of the camcorder, the "InfoLITHIUM" battery pack measures the battery consumption and calculates the remaining battery power. If the condition changed drastically, the remaining battery indication may suddenly decrease or increase by more than 2 minutes.

Even if 5 to 10 minutes is indicated as the battery remaining time in the viewfinder, the  indicator may also flash under some condition.

### To obtain more accurate remaining battery indication

Set the camcorder to recording standby mode and point towards a stationary object. Do not move the camcorder for 30 seconds or more.

- If the indication seems incorrect, use up the battery pack and then recharge it fully (Full charge<sup>1)</sup>). Note that if you have used the battery in a hot or cold environment for long time, or you have repeated charging many times, the battery pack may not be able to show the correct time even after being fully charged.
- After you have used the "InfoLITHIUM" battery pack with an equipment not having the  mark, make sure that you use up the battery pack on the equipment having the  mark and then recharge fully.

### Why the remaining battery indication does not match the continuous recording time in the operation manual

The recording time is affected by the environmental temperature and conditions. The recording time becomes very short in a cold environment. The continuous recording time in the operation manual is measured under the condition of using a fully charged (or normal charged<sup>2)</sup>) battery pack in 77°F (25°C). As the environmental temperature and condition are different when you actually use the camcorder, the remaining battery time is not same as the continuous recording time in the operation manual.

<sup>1)</sup> Full charge: Charging for about 1 hour after the CHARGE lamp of the AC power adaptor goes off.

<sup>2)</sup> Normal charge: Charging just until the CHARGE lamp of the AC power adaptor goes off.

## Notes on charging

### A brand-new battery pack

A brand-new battery pack is not charged. Before using the battery pack, charge it completely.

### Recharge the battery pack whenever you like

You do not have to discharge it before recharging. If you charged the battery pack fully but you did not use it for a long time, it becomes discharged. Then recharge the battery pack before use.

## Notes on the terminals

**If the terminals (metal parts on the back) are not clean, the battery charge duration will be shortened.**

When the terminals are not clean or when the battery pack has not been used for a long time, repeatedly install and remove the battery pack a few times. This improves the contact condition. Also, wipe the + and - terminals with a soft cloth or paper.

## Tips for using the battery pack

### Notes on the battery case

- Use only with alkaline batteries. You cannot use the battery case with manganese batteries or size AA (LR6) rechargeable NiCd batteries.
- Using with Sony alkaline batteries is preferable.
- Battery life is remarkably shorter in a cold environment (lower than 50°F/10°C).
- Keep the metal part clean. If it gets dirty, wipe it with a soft cloth.
- Do not disassemble or convert the battery case.
- Do not expose the battery case to any mechanical shock.
- During recording, the battery case heats up. This is not cause for concern.
- Prevent the electrode in the battery case from coming in contact with a metal object.
- If you will not use the battery case for a long time, detach the battery case from the camcorder and remove the batteries from the battery case.

#### If battery leakage occurred




- Wipe off the liquid in the battery case carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

## Maintenance information and precautions

### Moisture condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. Please, take the following precautions.

#### Inside the camcorder

If there is moisture inside the camcorder, the beep sounds and the  indicator flashes. If this happens, none of the functions except cassette ejection will work. Open the cassette compartment, turn off the camcorder, and leave it about 1 hour. When  indicator flashes at the same time, the cassette is inserted in the camcorder. Eject the cassette, turn off the camcorder, and leave also the cassette about 1 hour. The camcorder can be used again if the  indicator does not appear when the power is turned on again.

#### On the lens

If moisture condenses on the lens, no indicator appears, but the picture becomes dim. Turn off the power and do not use the camcorder for about 1 hour.


#### How to prevent moisture condensation

When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

- (1) Be sure to tightly seal the plastic bag containing the camcorder.
- (2) Remove the bag when the air temperature inside it has reached the temperature surrounding it (after about 1 hour).

## Maintenance information and precautions

### Video head cleaning

To ensure normal recording and clear pictures, clean the video heads. When the  indicator and "CLEANING CASSETTE" message appear one after another in the viewfinder or playback pictures are "noisy" or hardly visible, the video heads may be dirty.



[a] → [b]

[a] Slightly dirty

[b] Very dirty

If this happens, clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied). After checking the picture, if it is still "noisy," repeat the cleaning. (Do not repeat cleaning more than 5 times in one session.)

#### Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

#### Note

If the Sony V8-25CLH cleaning cassette is not available in your area, consult your nearest Sony dealer.

Additional Information

### Precautions

#### Camcorder operation

- Operate the camcorder on 7.2 V (battery pack) or 8.4 V (AC power adaptor).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid get inside the casing, unplug the camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when not using the camcorder.
- Do not wrap up the camcorder and operate it since heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.

#### On handling tapes

Do not insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape and if the recording tab is in or out.

### Camcorder care

- When the camcorder is not to be used for a long time, disconnect the power source and remove the tape. Periodically turn on the power, operate the camera and player sections and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.
- Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction, and sometimes this malfunction cannot be repaired.

### AC power adaptor

#### Charging

- Use only a lithium ion type battery pack.
- Place the battery pack on a flat surface without vibration during charging.
- The battery pack will get hot during charging. This is normal.

#### Others

- Unplug the unit from the wall outlet when not in use for a long time. To disconnect the power cord, pull it out by the plug. Never pull the cord itself.
- Do not operate the unit with a damaged cord or if the unit has been dropped or damaged.
- Do not bend the AC power cord forcibly, or put a heavy object on it. This will damage the cord and may cause a fire or electrical shock.
- Be sure that nothing metallic comes into contact with the metal parts of the connecting plate. If this happens, a short may occur and the unit may be damaged.
- Always keep the metal contacts clean.
- Do not disassemble the unit.
- Do not apply mechanical shock or drop the unit.
- While the unit is in use, particularly during charging, keep it away from AM receivers and video equipment because it will disturb AM reception and video operation.
- The unit becomes warm while in use. This is normal.
- Do not place the unit in locations that are:
  - Extremely hot or cold
  - Dusty or dirty
  - Very humid
  - Vibrating

### Notes on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following.

- Be sure to insert the batteries in the correct direction.
- Dry batteries are not rechargeable.
- Do not use a combination of new and old batteries.
- Do not use different types of batteries.
- The batteries slowly discharge while not in use.
- Do not use a battery that is leaking.

If any difficulty should arise, unplug the unit and contact your nearest Sony dealer.

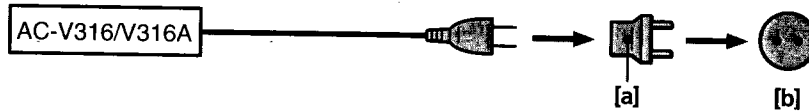
# Using your camcorder abroad

Each country or area has its own electric and TV color systems. Before using your camcorder abroad, check the following points.

## Power sources

You can use your camcorder in any country or area with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Use a commercially available adaptor [a], if necessary, depending on the design of the wall outlet [b].



## Difference in color systems

This camcorder is an NTSC system-based camcorder. If you want to view the playback picture on a TV, it must be an NTSC system-based TV. Check the following list.

### NTSC system

Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

### PAL system

Australia, Austria, Belgium, China, Denmark, Finland, Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

### PAL-M system

Brazil

### PAL-N system

Argentina, Paraguay, Uruguay

### SECAM system

Bulgaria, Czech Republic, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Slovak Republic, Ukraine, etc.

Additional Information

# Trouble check

If you run into any problem using the camcorder, use the following table to troubleshoot the problem. Should the difficulty persist, disconnect the power source and contact your Sony dealer or local authorized Sony service facility.

## Camcorder

### Power







Symptom	Cause and/or Corrective Action
The power is not on.	<ul style="list-style-type: none"> <li>• The battery pack is not installed. → Install the battery pack. (p. 8)</li> <li>• The battery is dead. → Use a charged battery pack. (p. 6)</li> <li>• The AC power adaptor is not connected to a wall outlet. → Connect the AC power adaptor to a wall outlet. (p. 22)</li> <li>• You use other types of battery except an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack (p. 6)</li> </ul>
The power goes off.	<ul style="list-style-type: none"> <li>• While being operated in CAMERA mode, the camcorder has been in Standby mode for more than 5 minutes. → Turn STANDBY down once and then up again. (p. 12)</li> <li>• The battery is dead. → Use a charged battery pack. (p. 6)</li> <li>• If VF PW-SAVE is set to ON, the picture disappears automatically when you turn your face away from the viewfinder. → Bring your face close to the viewfinder within 1/2 inch (1 cm). Or set VF PW-SAVE to OFF. (p. 25)</li> </ul>
The battery pack is quickly discharged.	<ul style="list-style-type: none"> <li>• The ambient temperature is too low. (p. 49)</li> <li>• The battery pack has not been charged fully. → Charge the battery pack again. (p. 6)</li> <li>• The battery pack is completely dead, and cannot be recharged. → Use another battery pack. (p. 8)</li> <li>• You use other types of battery except an "InfoLITHIUM" battery pack. → Use an "InfoLITHIUM" battery pack (p. 6)</li> </ul>
The beep sounds when the battery is attached.	<ul style="list-style-type: none"> <li>• The battery pack is discharged during a long period of storage. → Charge the battery pack again. (p.6)</li> </ul>
When you turn off the power, the lens makes a noise.	<ul style="list-style-type: none"> <li>• The camcorder is not malfunctioning.</li> </ul>

### Operation

Symptom	Cause and/or Corrective Action
START/STOP does not operate.	<ul style="list-style-type: none"> <li>• The tape is stuck to the drum. → Eject the tape. (p. 10)</li> <li>• The tape has run out. → Rewind the tape or use a new one. (p. 20)</li> <li>• The POWER switch is set to VTR. → Set it to CAMERA. (p. 11)</li> <li>• The tab on the cassette is out (red). → Use a new tape or slide the tab. (p.10)</li> </ul>



## Trouble check

Symptom	Cause and/or Corrective Action
Recording stops in a few seconds.	<ul style="list-style-type: none"> <li>The START/STOP MODE switch is set to 5 SEC or ANTI GROUND SHOOTING  . → Set it to  . (p. 15)</li> </ul>
The cassette cannot be removed from the holder.	<ul style="list-style-type: none"> <li>The battery is dead. → Use a charged battery pack or the AC power adaptor. (p. 6, 22)</li> </ul>
 and  indicators flash and no function except for cassette ejection works.	<ul style="list-style-type: none"> <li>Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least 1 hour. (p. 52)</li> </ul>
The counter, date or time indicator is flashing.	<ul style="list-style-type: none"> <li>You pressed DATE and TIME together for more than 2 seconds. → The camcorder is not malfunctioning. You may start recording. Flashing will stop soon.</li> <li>The lithium battery is weak or dead. → Replace the lithium battery with a new one. (p. 46)</li> </ul>
The tape does not move when a video control button is pressed.	<ul style="list-style-type: none"> <li>The POWER switch is set to CAMERA or OFF. → Set it to VTR.</li> <li>The tape has run out. → Rewind the tape or use a new one. (p. 20)</li> </ul>
The SteadyShot function does not activate.	<ul style="list-style-type: none"> <li>STEADY SHOT is set to OFF. → Set STEADY SHOT to ON. (p. 45)</li> <li>The SteadyShot function does not work when the wide mode is set to 16:9 FULL.</li> </ul>
The autofocus function does not work.	<ul style="list-style-type: none"> <li>FOCUS is set to MANUAL. → Set it to AUTO. (p. 31)</li> <li>Shooting conditions are not suitable for autofocus. → Set FOCUS to MANUAL to focus manually. (p. 31)</li> </ul>
The fader function does not activate.	<ul style="list-style-type: none"> <li>START/STOP MODE is set to 5 SEC or ANTI GROUND SHOOTING  . → Set it to  . (p. 15)</li> <li>A title is displayed. → Stop superimposing the title.</li> </ul>
No sound or only a low sound is heard when playing back a tape.	<ul style="list-style-type: none"> <li>The stereo tape is played back with HiFi SOUND set to 1 or 2 in the menu system. → Set to STEREO in the menu system. (p. 26)</li> </ul>
Excessive high-pitched sound is heard.	<ul style="list-style-type: none"> <li>The picture has been recorded with WIND set to ON in the menu system. → When there is no wind, set it to OFF. (p. 25)</li> </ul>
The date or time indicator disappears.	<ul style="list-style-type: none"> <li>Reset the date and time. (p. 47)</li> </ul>

Additional Information

(to be continued)

## Trouble check

### Picture

Symptom	Cause and/or Corrective Action
The image on the viewfinder screen is not clear.	<ul style="list-style-type: none"> <li>The viewfinder lens is not adjusted. → Adjust the viewfinder lens. (p. 12)</li> </ul>
A vertical band appears when a subject such as lights or a candle flame is shot against a dark background.	<ul style="list-style-type: none"> <li>The contrast between the subject and background is too high. The camcorder is not malfunctioning. → Change locations.</li> </ul>
A vertical band appears when shooting a very bright subject.	<ul style="list-style-type: none"> <li>The camcorder is not malfunctioning.</li> </ul>
The playback picture is not clear.	<ul style="list-style-type: none"> <li>EDIT is set to ON in the menu system. → Set it to OFF. (p. 26)</li> </ul>
The picture is "noisy".	<ul style="list-style-type: none"> <li>The video heads may be dirty. → Clean the heads using the Sony V8-25CLH cleaning cassette (not supplied). (p. 53)</li> </ul>
The picture does not appear in the viewfinder.	<ul style="list-style-type: none"> <li>If VF PW-SAVE is set to ON, the picture disappears automatically when you turn your face away from the viewfinder. → Bring your face close to the viewfinder within 1/2 inch (1 cm). Or set VF PW-SAVE to OFF. (p. 25)</li> </ul>
The picture in the viewfinder does not disappear even if VF PW-SAVE is set to ON.	<ul style="list-style-type: none"> <li>Sunlight or an incandescent lamp may prevent the viewfinder sensor from working correctly. This is not a malfunction.</li> </ul>
An unknown picture is displayed in the viewfinder.	<ul style="list-style-type: none"> <li>If 10 minutes elapse after you set the POWER switch to CAMERA without inserting a cassette, the camcorder automatically starts the demonstration or DEMO is set to ON in the menu system. → Insert the cassette and the demonstration stops. You can make the demonstration not appear. (p. 26)</li> </ul>
The five digit code appears.	<ul style="list-style-type: none"> <li>The self-diagnosis function is activated. → Check the code and solve the problem. (p. 60)</li> </ul>

### Others

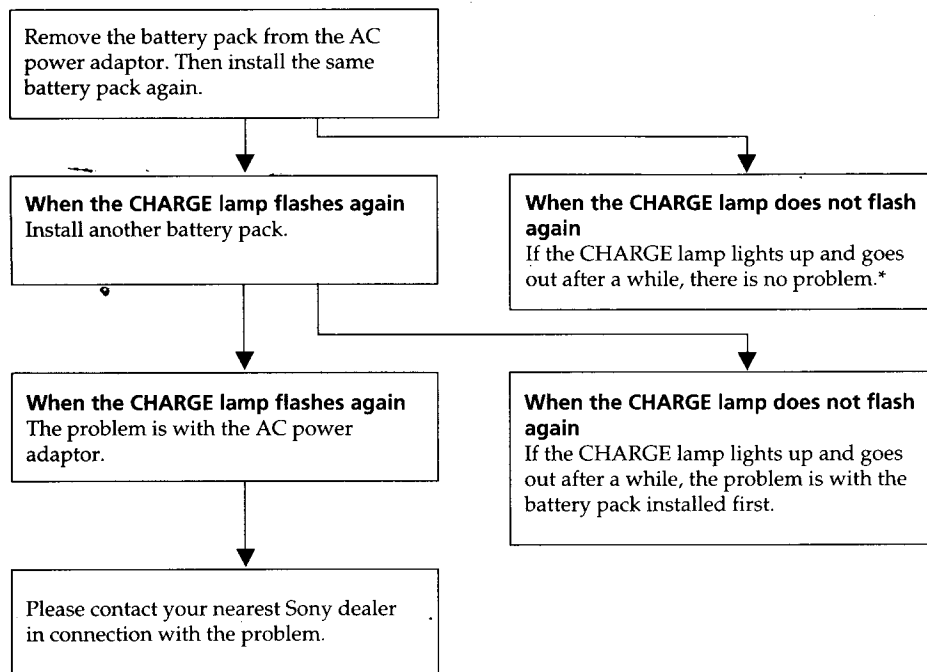
Symptom	Cause and/or Corrective Action
The supplied Remote Commander does not work.	<ul style="list-style-type: none"> <li>COMMANDER is set to OFF in the menu system. → Set it to ON. (p. 67)</li> <li>Something is blocking the infrared rays. → Remove the obstacle.</li> <li>The batteries are not inserted with the correct polarity. → Insert the batteries with the correct polarity. (p. 67)</li> <li>The batteries are dead. → Insert new ones. (p. 67)</li> </ul>

## Trouble check

Symptom	Corrective Actions
The VTR/CAMERA or CHARGE lamp does not light.	<ul style="list-style-type: none"> <li>Disconnect the power cord. After about 1 minute, reconnect the power cord.</li> </ul>
The CHARGE lamp flashes.	<ul style="list-style-type: none"> <li>See the following chart.</li> </ul>

### When the CHARGE lamp flashes

Check through the following chart.



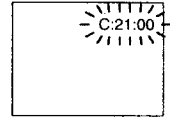
Additional Information

- \* If you use a battery pack which you have just bought or which has been left unused for a long time, the CHARGE lamp may flash at the first charging. This does not indicate a problem. Repeat again to charge with the same battery pack.

## Trouble check

### Self-diagnosis function

If the self-diagnosis function is activated to prevent the camcorder from operating abnormally, the five digit service number (combination of an alphabet and figures) flashes in the viewfinder or display window. In this case, check the following table.



First three digits	Cause and/or Corrective Action
C21	<ul style="list-style-type: none"><li>Moisture condensation has occurred. → Remove the cassette and leave the camcorder for at least 1 hour. (p. 52)</li></ul>
C22	<ul style="list-style-type: none"><li>The video heads are dirty. → Clean the heads using the Sony V8-25 CLH cleaning cassette (not supplied). (p. 53)</li></ul>
C23	<ul style="list-style-type: none"><li>The camcorder does not operate when using a battery that is not an InfoLITHIUM battery. → Use an InfoLITHIUM battery. (p. 6)</li></ul>
C31	<ul style="list-style-type: none"><li>To prevent the camcorder from operating abnormally, the self-diagnosis function has come on. → Remove the cassette and insert it again, and then operate the camcorder. (p. 10)</li></ul>
C32	<ul style="list-style-type: none"><li>To prevent the camcorder from operating abnormally, the self-diagnosis function has come on. → Disconnect the power cord of the AC power adaptor or remove the battery pack. After reconnecting or reattaching the power source, operate the camcorder.</li></ul>
E61 E62	<ul style="list-style-type: none"><li>To prevent the camcorder from operating abnormally, the self-diagnosis function has come on. → When you contact your local authorized Sony service facility, inform the service number with five digits. (example: E:61:10)</li></ul>

If a difficulty persists after checking the problem a few times, contact your local authorized Sony service facility.

# Specifications

## Video camera recorder

### Video recording system

Four rotary heads, Helical scanning FM system (separate SP/LP heads)

### Audio recording system

Rotary heads, FM system

### Video signal

NTSC color, EIA standards

### Usable cassette

8mm video format cassette (Hi8 or standard 8)

### Recording / Playback time (using 120 min. cassette)

SP mode: 2 hours

LP mode: 4 hours

### Fastforward/rewind time (using 120 min. cassette)

Approx. 5 min.

### Image device

CCD (Charge Coupled Device)

### Viewfinder

Electronic viewfinder (Color)

### Lens

Combined power zoom lens

Filter diameter 1 7/16 in. (37 mm)

15x (Optical)

30x (Digital)

### Focal distance

3/16 - 2 3/8 in. (4.1 - 61.5 mm)

1 7/8 - 27 7/8 in. (47 - 705 mm)

when converted to a 35 mm still camera

### Color temperature

Auto

### Minimum illumination

2 lux (F 1.4)

### Illumination range

2 lux to 100,000 lux

### Recommended illumination

More than 100 lux

## Input and output connectors

### 5 video input/output

4-pin mini DIN

Luminance signal: 1 Vp-p, 75 ohms, unbalanced, sync negative

Chrominance signal: 0.286 Vp-p, 75 ohm, unbalanced

### Video input/output

Phono jack, 1 Vp-p, 75 ohm, unbalanced, sync negative

## Audio input/output

Phono jacks (2: stereo L and R)  
327 mV, (at output impedance 47 kilohm) impedance less than 2.2 kilohm

### RFU DC OUT

Special minijack, DC 5 V

### Headphone jack

Stereo minijack

### LANC control jack

Stereo mini-minijack (ø 2.5 mm)

### MIC jack

Minijack, 0.388 mV low impedance with 2.5 to 3.0 V DC, output impedance 6.8 kilohm (ø 3.5 mm)

Stereo type

### Intelligent accessory shoe

8-pin connector

### LASER LINK

Video/audio: IR space transmission system according to EIAJ (Electric Industries Association of Japan) standards

Audio carrier wave:

L ch 4.3 MHz

R ch 4.8 MHz

## General

### Power requirements

7.2 V (battery pack)

8.4 V (AC power adaptor)

### Average power consumption

3.5 W during camera recording

### Operating temperature

32°F to 104°F (0°C to 40°C)

### Storage temperature

-4°F to +140°F (-20°C to +60°C)

### Dimensions (Approx.)

4 3/8 x 4 1/4 x 7 1/8 in.

(108 x 107 x 178 mm) (w/h/d)

### Mass (Approx.)

1 lb 11 oz (770 g) excluding the battery pack, lithium battery, cassette and shoulder strap

2 lb (920 g) including the battery pack NP-F330, lithium battery CR2025, cassette and shoulder strap

### Microphone

Stereo type

### Supplied accessories

See page 5.

## AC power adaptor

### Power requirements

110 - 240 V AC, 50/60 Hz

### Power consumption

25 W

### Output voltage

DC OUT: 8.4 V, 1.9 A in operating mode

Battery charge terminal: 8.4 V, 1.4 A in charge mode

### Application

Sony battery packs NP-F330, NP-F530, NP-F730, NP-F930 lithium ion type

### Operating temperature

32°F to 104°F (0°C to 40°C)

### Storage temperature

-4°F to +140°F (-20°C to +60°C)

### Dimensions (Approx.)

3 1/4 x 1 13/16 x 6 1/2 in.

(81 x 45 x 163 mm) (w/h/d) including projecting parts and controls

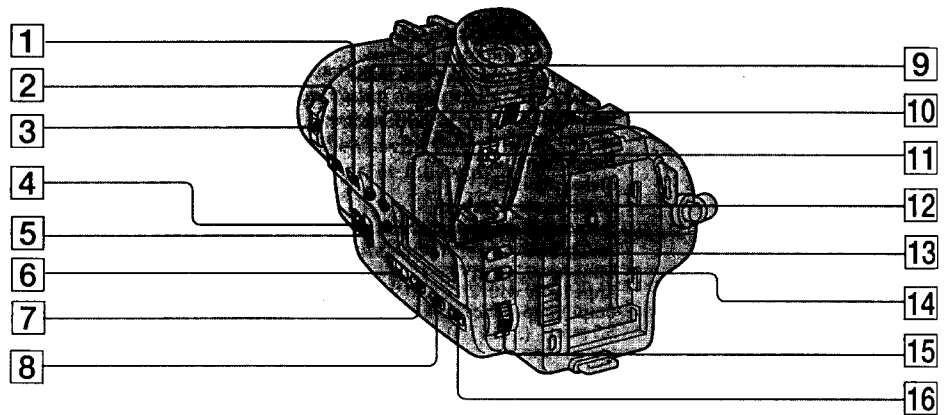
### Mass (Approx.)

1 lb 3 oz (560 g)

Design and specifications are subject to change without notice.

Additional Information

## Identifying the parts



1 BACKLIGHT button (p.35)

2 FADER button (p.27)

3 POWER switch (p.11)

4 NEAR/FAR dial (p.32)

5 FOCUS switch (p.32)

6 STEADY SHOT switch (p.45)

7 PICTURE EFFECT button (p.29)

8 EXPOSURE button (p.35)

9 DATE button (p.41)

10 TIME button (p.41)

11 COUNTER RESET button (p.13)

12 Display window (p.69)

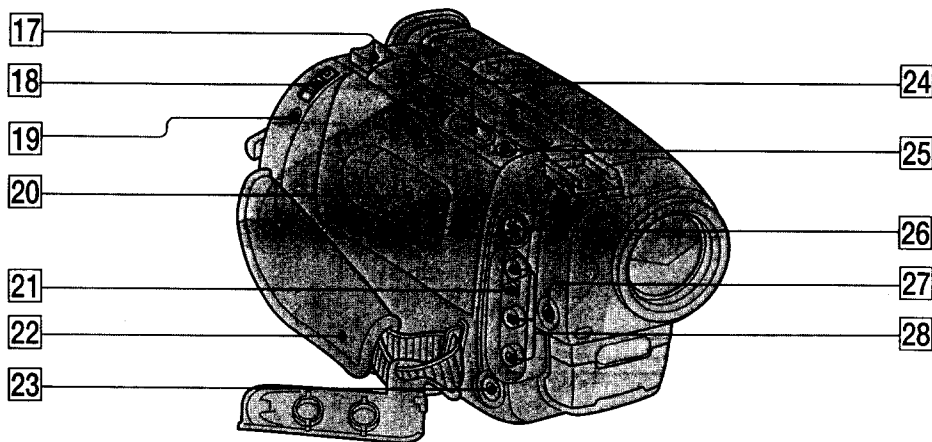
13 TITLE button (p.38)

14 MENU button (p.24)

15 CONTROL dial (p.24)

16 PROGRAM AE button (p.33)



## Identifying the Parts



**17 Power zoom lever** (p.14)

**18 EJECT switch** (p.10)

**19 LANC  control jack**

 stands for Local Application Control Bus System. The  control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.

**20 Cassette compartment** (p.10)

**21 RFU DC OUT (RFU adaptor DC output) jack** (p.18)

**22 Grip strap** (p.16)

**23  (headphones) jack** (p.20)

**24 EDITSEARCH button** (p.17)

**25 LASER LINK button** (p.19)

**26 S VIDEO jack** (p.18, 44)

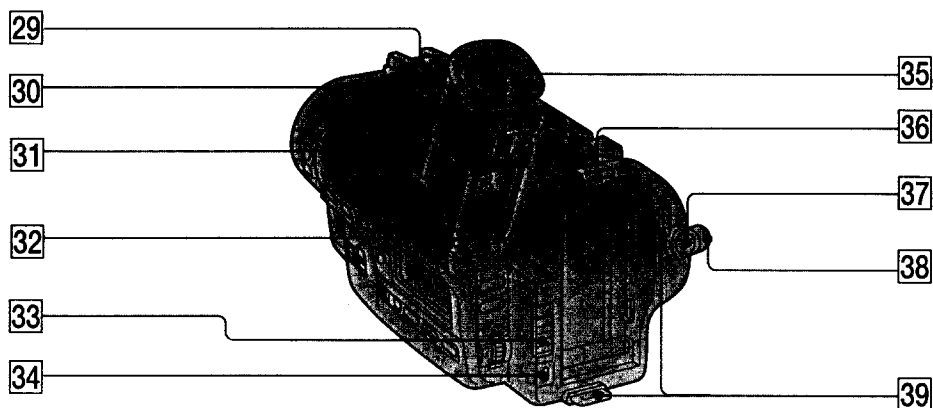
**27 MIC jack (PLUG IN POWER)**

Connect an external microphone (not supplied). This jack also accepts a "plug-in-power" microphone.

**28 VIDEO/AUDIO jacks** (p.18, 44)

Additional Information

## Identifying the Parts



**29 Intelligent accessory shoe**

The intelligent accessory shoe supplies power to optional accessories such as a video light.

**30 Eyecup (p.16)**

**31 Viewfinder (p.12, 16)**

**32 Battery mounting surface**

**33 START/STOP MODE switch (p.15)**

**34 16:9 WIDE button (p.28)**

**35 Viewfinder lens adjustment lever (p.12)**

**36 BATT (battery) PUSH button (p.8)**

**37 START/STOP button (p.11)**

**38 STANDBY switch (p.11)**

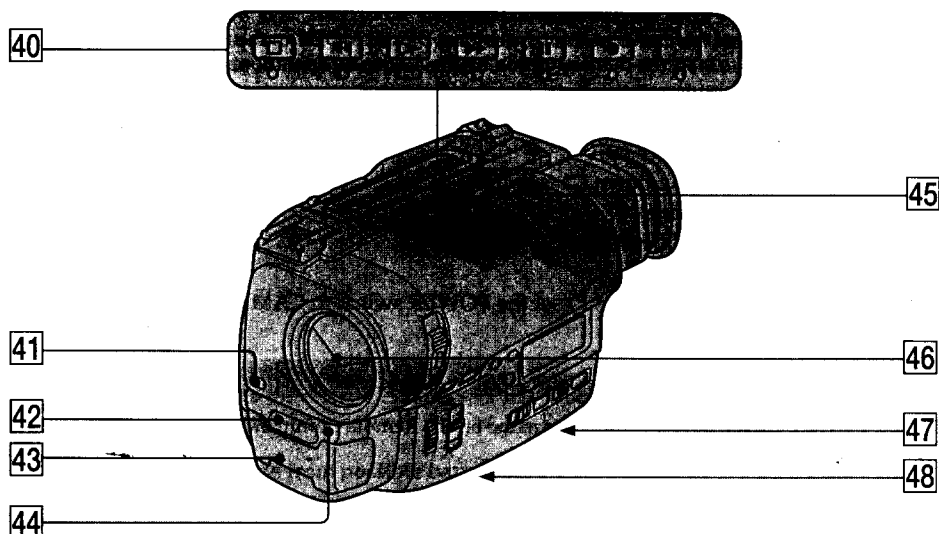
**39 Hooks for shoulder strap (p.68)**

### Note on the intelligent accessory shoe

Supplies power to optional accessories such as a video light or microphone. The intelligent accessory shoe is linked to the STANDBY switch, allowing you to turn on and off the power supplied by the shoe. Refer to the instruction manual of the accessory for further information. To connect an accessory, press down and push it to the end, and then tighten the screw. To remove an accessory, loosen the screw, and then press down and pull out the accessory.



## Identifying the parts



Additional Information

### 40 Video control buttons (p.20)

- STOP (stop)
- ◀ REW (rewind)
- ▷ PLAY (playback)
- ▶▶ FF (fastforward)
- || PAUSE (pause)
- REC (recording)

### 41 Camera recording/battery lamp (p.11)

### 42 IR transmitter (p.19)

### 43 Microphone

### 44 Remote sensor (p.68)

Aim the Remote Commander here for remote control.

### 45 Lighting aperture (p.12)

### 46 Lens cover

### 47 Lithium battery compartment (p.46)

### 48 Tripod receptacle (p.16)

Make sure that the length of the tripod screw is less than 9/32 inch (6.5 mm) otherwise, you cannot attach the tripod securely and the screw may damage the camcorder.

## Identifying the parts

### To watch the demonstration

You can start the demonstration by setting DEMO MODE in the menu system. You can also start the demonstration by the following operation.

#### To enter demo mode

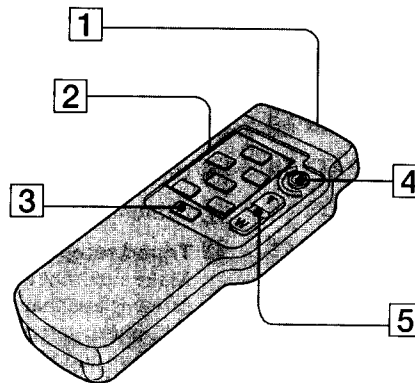
- (1) Eject the cassette and set the POWER switch to VTR.
- (2) Turn STANDBY up.
- (3) While holding down  $\triangleright$  set the POWER switch to CAMERA.

#### To exit demo mode

- (1) Set the POWER switch to VTR.
- (2) Turn STANDBY up.
- (3) While holding down  $\square$  set the POWER switch to CAMERA.

## Remote Commander

The buttons that have the same name on the Remote Commander as on the camcorder function identically.



**1 Transmitter**

Point toward the remote sensor to control the camcorder after turning on the camcorder.

**2 Tape transport buttons (p.20)**

**3 DISPLAY button (p.20)**

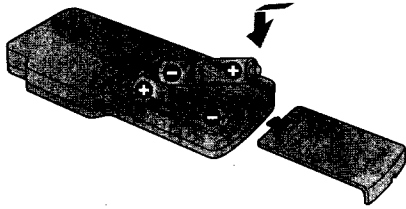
**4 START/STOP button (p.11)**

**5 Power zoom button (p.14)**

## Identifying the parts

### To prepare the Remote Commander

Insert two size AA (R6) batteries by matching the + and - on the batteries to the diagram inside the battery compartment.



### Note on battery life

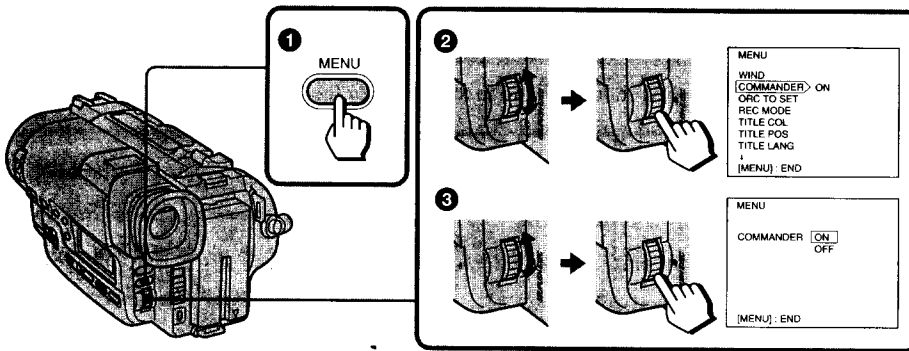
The batteries for the Remote Commander last about 6 months under normal operation. When the batteries become weak or dead, the Remote Commander does not work.

### To avoid damage from possible battery leakage

Remove the batteries when you will not use the Remote Commander for a long time.

### To use the Remote Commander

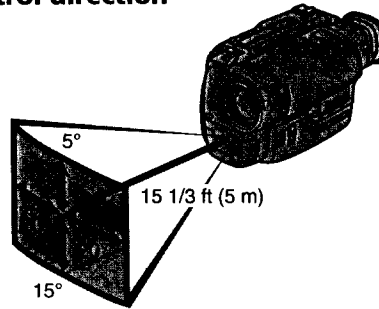
Make sure that the COMMANDER is set to ON in the menu system on the camcorder.



Additional Information

## Identifying the parts

### Remote control direction

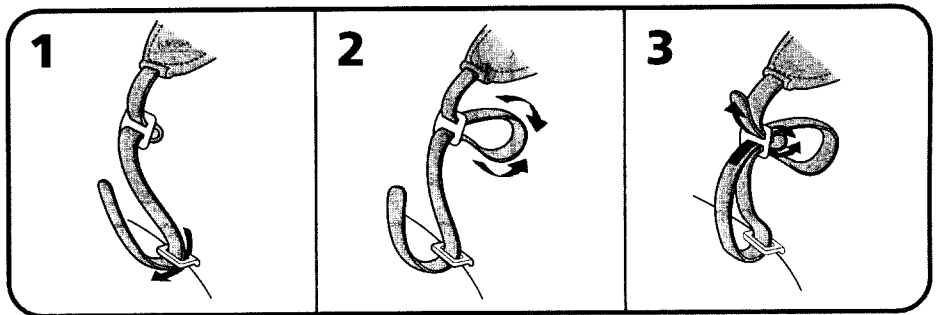


### Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise, the remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor on the camcorder and the Remote Commander.
- This camcorder works in commander mode VTR 2. The commander modes (1, 2 and 3) are used to distinguish this camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in commander mode VTR 2, we recommend you change the commander mode or cover the remote sensor of the VCR with black paper.

### Attaching the shoulder strap

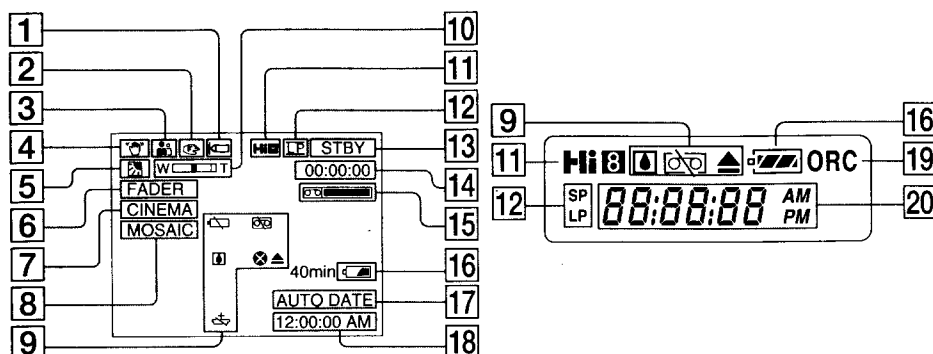
Attach the supplied shoulder strap to the hooks for the shoulder strap .



## Operation Indicator

Viewfinder

Display window



1 WIND indicator (p.25)

2 Manual focusing (p.32)

3 PROGRAM AE indicator (p.33)

4 SteadyShot indicator (p.45)

5 Backlight indicator (p.35)

6 FADER indicator (p.27)

7 Wide mode indicator (p.28)

8 Picture effect indicator (p.29)

9 Warning indicators (p.70)

10 Exposure indicator/Zoom indicator (p.14, 35)

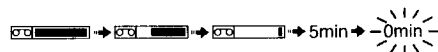
11 Playing back or recording in Hi8 format (p.48)

12 Recording mode indicator (p.48)

13 Video control mode (p.20)

14 Tape counter (p.13)  
Self-diagnosis indicator (p.60)

15 Remaining tape indicator



16 Remaining battery indicator (p.49)



17 AUTO DATE indicator (p.11)

18 Date or Time indicator (p.41)

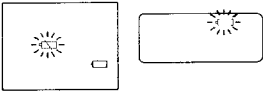
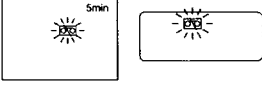
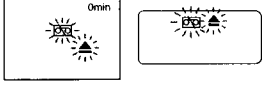
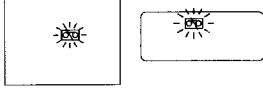
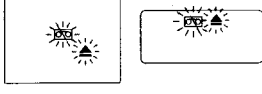
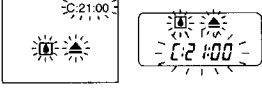
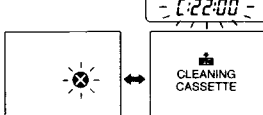
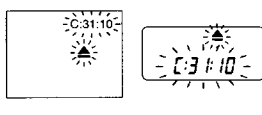
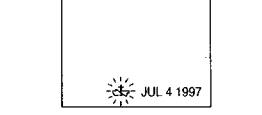
19 ORC indicator (p.42)

20 Date or Time indicator (p.41)/  
Tape counter (p.13)/  
Self-diagnosis indicator (p.60)

Additional Information

# Warning indicators

If indicators flash in the viewfinder or in the display window, check the following:  
 ♪: you can hear the beep sound when the BEEP is set to ON.

<b>1</b> <b>Viewfinder    Display window</b> 	<b>2</b> 	<b>3</b> 
<b>4</b> 	<b>5</b> 	<b>6</b> 
<b>7</b> 	<b>8</b> 	<b>9</b> 

- |   |  |
|---|--|
| <p><b>1 The battery is weak or dead.</b><br/>             Slow flashing: The battery is weak.<br/>             Fast flashing: The battery is dead.</p> <p><b>2 The tape is near the end.</b><br/>             The flashing is slow.</p> <p><b>3 The tape has run out.</b><br/>             The flashing becomes rapid.</p> <p><b>4 No tape has been inserted.</b></p> <p><b>5 The tab on the tape is out (red).</b></p> <p><b>6 Moisture condensation has occurred.</b><br/>             (p.52)</p> | <p><b>7 The video heads may be contaminated.</b> (p.53)</p> <p><b>8 Some other trouble has occurred.</b><br/>             Use the self-diagnosis function (p.60).<br/>             If the display does not disappear contact your Sony dealer or local authorized Sony service facility.</p> <p><b>9 The lithium battery is weak or is not installed.</b> (p.46)</p> |
|---|--|

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Additional Information